National Aeronautics and Space Administration

Aeronautical E

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges.

STAR (N-10000 Series) N79-21994 - N79-23887

IAA (A-10000 Series) A79-32247 – A79-35926

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

AERONAUTICAL ENGINEERING

A Continuing Bibliography

Supplement 112

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in July 1979 in

- Scientific and Technical Aerospace Reports (STAR)
- International Aerospace Abstracts (IAA)

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price code E02 (\$4.75 domestic, \$9.50 foreign)

INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971. Since that time, monthly supplements have been issued.

This supplement to Aeronautical Engineering -- A Continuing Bibliography (NASA SP-7037) lists 424 reports, journal articles, and other documents originally announced in July 1979 in Scientific and Technical Aerospace Reports (STAR) or in International Aerospace Abstracts (IAA)

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, IAA Entries and STAR Entries, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in IAA and STAR, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included An annual cumulative index will be published

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A79-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc (AIAA) as follows. Paper copies of accessions are available at \$6.00 per document up to a maximum of 20 pages. The charge for each additional page is \$0.25. Microfiche of documents announced in IAA are available at the rate of \$2.50 per microfiche on demand and at the rate of \$1.10 per microfiche for standing orders for all IAA microfiche. The price for the IAA microfiche by category is available at the rate of \$1.25 per microfiche plus a \$1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of \$1.35 per microfiche.

Minimum air-mail postage to foreign countries is \$1.00 and all foreign orders are shipped on payment of pro-forma invoices

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications

STAR ENTRIES (N79-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail NTIS Sold by the National Technical Information Service Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the STAR citation. Current values for the price codes are given in the tables on page viii

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section. Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS When ordering NASA publications (those followed by the * symbol), use the N accession number NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other report number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail SOD (or GPO) Sold by the Superintendent of Documents U.S. Government Printing Office in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$3.00 price, for those documents identified by a # symbol.)

⁽¹⁾ A microfiche is a transparent sheet of film 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26.1 reduction)

- Avail NASA Public Document Rooms Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126) 600 Independence Ave SW Washington DC 20546 or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory
- Avail DOE Depository Libraries Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet *DOE Technical Information Center Its Functions and Services* (TID-4660) which may be obtained without charge from the DOE Technical Information Center
- Avail Univ Microfilms Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm All requests should cite the author and the Order Number as they appear in the citation
- Avail USGS Originals of many reports from the U.S. Geological Survey which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail HMSO Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given or a conversion table may be obtained from PHI.
- Avail BLL (formerly NLL) British Library Lending Division Boston Spa, Wetherby, Yorkshire, England Photocopies available from this organization at the price shown (If none is given inquiry should be addressed to the BLL)
- Avail Fachinformationszentrum Karlsruhe Sold by the Fachinformationszentrum Energie Physik Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany at the price shown in deutschmarks (DM)
- Avail Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free
- Other availabilities If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the STAR Entries and IAA Entries sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA A listing of public collections of NASA documents is included on the inside back cover

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS) The annual subscription rate for the monthly supplements is \$45.00 domestic, \$75.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn. Subscriptions, 5285 Port Royal Road, Springfield Virginia 22161.

1 V

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics Technical Information Service 750 Third Ave New York, N.Y. 10017

British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England

Commissioner of Patents and Trademarks U.S. Patent and Trademark Office Washington, D.C. 20231

Department of Energy Technical Information Center P O Box 62 Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service ESRIN Via Galileo Galilei 00044 Frascati (Rome) Italy

Her Majesty's Stationery Office P O Box 569, S E 1 London, England

NASA Scientific and Technical Information Facility P O Box 8757 B W I Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Branch (NST-41)
Washington, D C 20546

National Technical Information Service 5285 Port Royal Road Springfield Virginia 22161

Pendragon House, Inc 899 Broadway Avenue Redwood City, California 94063

Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd Tylers Green London, England

U.S. Geological Survey 1033 General Services Administration Building Washington, D.C. 20242

U S Geological Survey 601 E Cedar Avenue Flagstaff, Arizona 86002

U S Geological Survey 345 Middlefield Road Menlo Park, California 94025

U S Geological Survey Bldg 25, Denver Federal Center Denver, Colorado 80225

Fachinformationszentrum Energie, Physik Mathematik GMBH 7514 Eggenstein Leopoldshafen Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective October 1 1977)

Price	Page Range	North American	Foreign	
Code		Price	Price	
A01	Microfiche	\$ 300	\$ 450	
A02	001 025	4 00	8 00	
A03	026 050	4 50	9 00 10 50 12 00	
A04	051 075	5 25		
A05	076 100	6 00		
A06	101 125	6 50	13 00	
A07	126 150	7 25	14 50	
A08	151 175 8 00		16 00	
A09	176 200	9 00	18 00	
A10	201 225	9 25	18 50	
A11	226 250	9 50	19 00	
A12	251 275	10 75	21 50	
A13	276 300	11 00	22 00	
A14	301 325	11 75	23 50	
A15	326 350	12 00	24 00	
A16	351 375	12 50	25 00	
A17	376 400	13 00	26 00	
A18	401 425	13 25	26 50	
A19	426 450	14 00	28 00	
A20	451 475	14 50	29 00	
A21	476 500	15 00	30 00	
A22	501 525	15 25	30 50	
A23	526 550	15 50	31 00	
A24	551 575	16 25	32 50	
A25	576 600	16 50	33 00	
A99	601 up	1/	2/	

^{1/} Add \$2.50 for each additional 100 page increment from 601 pages up

Schedule E EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

Price	North American	Foreign
Code	Price	Price
E01	\$ 325	\$ 650
E02	4 75	9 50
E03	6 25	12 50
E04	7 50	15 00
E05	9 00 e	18 00
€06	10 50	21 00
E07	12 50	25 00
E08	15 00	30 00
E09	17 50	35 00
E10	` 20 00	40 00
E11	22 50	45 00
E12	25 00	50 00
£13	28 00	56 00
E14	31 00	62 00
E15	34 00	68 00
E16	37 00	74 00
E17	40 00	80 00
E18	45 00	90 00
£19	50 00	100 00
£20	60 00	120 00
E95 Write for quote		
NO1	28 00	40 00

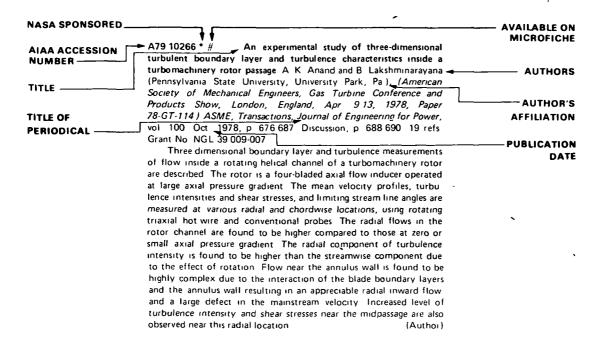
^{2/} Add \$5.00 for each additional 100 page increment from 601 pages up

TABLE OF CONTENTS

IAA Entries			• • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	389
STAR Entries .		• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •		413
Subject Index .					A -1
					B-1
Contract Numb	er Index				C-1
TYPICAL	CITATIO	N AND	ABST	RACT FR	OM STAR
NASA SPONSORED	-} \ -				AVAILABLE ON
NASA ACCESSION NUMBER	N79-10024*# Group STUDY OF A	Northrop Co	rp Hawthorne TECHNOLOGY	Calif Aircraft -	CORPORATE

FIGHTER/ATTACK AIRCRAFT HORIZONTAL ATTITUDE SOURCE **CONCEPT** Final Report S H Brown May 1978 242 p refs Sponsored in part by TITLE the David Taylor Naval Ship Research and Development Center **PUBLICATION** Bethesda Md (Contract NAS2-9771) DATE **AUTHOR** (NASA-CR 152130 NOR78-54) NTIS -HC A11/MF A01 CSCL 01A -A horizontal attitude VSTOL (HAVSTOL) supersonic fighter AVAILABILITY CONTRACT attack aircraft powered by RALS turbofan propulsion system is SOURCE OR GRANT analyzed Reaction control for subaerodynamic flight is obtained in pitch and yaw from the RALS and roll from wingtip jets powered by bleed air from the RALS duct Emphasis is placed REPORT COSATI on the development of aerodynamic characteristics and the identification of aerodynamic uncertainties. A wind tunnel program CODE NUMBERS is shown to resolve some of the uncertainties. Aerodynamic data developed are static characteristics about all axes control effectiveness drag propulsion induced effects and reaction control characteristics

TYPICAL CITATION AND ABSTRACT FROM *IAA*



AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 112)

AUGUST 1979

IAA ENTRIES

A79-32277 # Recent progress in active controls applied to flutter suppressors (Récents progres sur les contrôles actifs appliqués aux suppresseurs de flottement) R Destuynder Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 15th, Maiseille, France, Nov 7-9, 1978, Paper 20 p 7 refs In French

High subsonic wind tunnel testing-has been conducted on an aeroelastic model of a military aircraft wing to which various stores were attached, the aim of the wind tunnel tests was to investigate flutter control through the introduction of stiffness in the wing Tanks and wing-tip stores were among the attachments mounted on the wing The flutter control law developed here may be applied to preliminary design studies, as well as to studies necessitated by the attachment of external stores to existing aircraft Problems related to the interaction of active control systems also receive attention

J M B

A79-32278 # Aircraft response to lateral gusts- Exploratory study (Réponse de l'avion aux rafales laterales - Etude exploratoire)

J. L. Cocquerez and R. A. Verbrugge (Lille I, Université, Villeneuve d'Ascq, Nord, France) Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 15th, Marseille, France, Nov. 7-9, 1978, Paper. 35 p. In French

A simulation procedure involving guided models in free flight has been developed for evaluating the effects of lateral gust loads on aircraft. This paper describes the experimental method, the guidance procedure, and preliminary results. Particular attention is given to the effects of lateral gusts during critical phases of the flight, including approach and landing in a cross wind.

A79-32288 # Unsteady effects on a stalled wing in pulsed flow - Comparison with back-and forth oscillating case (Effets instationnaires sur un profil en decrochage dans un écoulement pulse - Comparaison avec le mouvement de tamis) C Maresca, D Favier, and J Rebont (CNRS, Aix Marseille I, Universite, Marseille, France) Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 15th, Marseille, France, Nov 7-9, 1978, Paper 64 p 7 refs In French Direction Technique des Constructions Aéronautiques Contract No 77/9831300/481/7586

Unsteady effects on a symmetric NACA 0012 profile at 20 deg angle of attack in a pulsed flow were studied quantitatively and qualitatively on the basis of measurements of the wrench of aerodynamic forces, static pressure distribution, and wall shear stress distribution, and on the basis of flow visualization at different times of the pulse period. The results are compared with those obtained previously for the same profile oscillating in a uniform flow, other conditions being equal. The reciprocal nature of the two cases was revealed with regard to mean effects during a cycle, lift, drag, pressure distributions, and the vortex shedding mechanisms at the upper profile surface.

A79-32290 # Implementation of unsteady oscillatory flows in a transonic wind tunnel (Mise au point d'ecoulements instationnaires oscillatoires dans une soufflerie transsonique) A Mignosi, J

L Gobert, and C Quemard (ONERA, Centre d'Etudes et de Recherches de Toulouse, Toulouse, France) Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquee, 15th, Marseille, France, Nov 7-9, 1978, Paper 40 p In French

The first results obtained during the implementation of oscillatory flows in the injector-driven transonic wind-tunnel T2 at ONERA-CERT are presented and analyzed. The oscillatory flow is obtained by making the downstream throat area periodically vary, owing to the rotation of a suitably shaped cam. The study examines the characteristics of the unsteady flow in the test section and compares the results with those of computations based on the resolution of the unstationary equations, assuming the flow to be one-dimensional. (Author)

A79-32293 # Review of problems of unsteady aerodynamics of helicopters (Synthèse des problèmes d'aerodynamique instationnaire de l'helicoptère) J Gallot (Societe Nationale Industrielle Aérospatiale, Marignane, Bouches du Rhône, France) Association Aéronautique et Astronautique de France, Colloque d'Aerodynamique Appliquée, 15th, Marseille, France, Nov 7-9, 1978, Paper 20 p 34 refs in French

Various problems associated with unsteady rotor aerodynamics are surveyed and the practical impact of these problems on helicopter operation is discussed. Various methods for incorporating these unsteady effects into the design procedure are examined, including aerodynamic models of the rotor, introduction of unsteady effects in the calculations, and unsteady two dimensional simulations. Consideration of unsteady effects in models for predicting aerodynamic loads should make it possible to minimize such problems as stall flutter or Mach tuck.

A79-32294 # Retreating blade and dynamic stall (Pale reculante et décrochage dynamique) J Renaud (Societe Nationale Industrielle Aérospatiale, Division Helicopteres, Marignane, Bouchesdu-Rhône, France) Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 15th, Marseille, France, Nov 7-9, 1978, Paper 23 p 16 refs In French

Simulations of dynamic stall on an oscillating airfoil show that stall delay, in unsteady regime, is associated with the development of an organized vortex system on the leading edge. Two-dimensional tests permit deducing some synthetic laws for the occurrence of stall

A79-32295 # Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors (Etudes expérimentales d'aérodynamique instationnaire sur des maquettes de rotors d'hélicoptere en soufflerie) J.-J. Philippe, P. Lafon, and J. C. Bohl (ONERA, Châtillon sour-Bagneux, Hauts-de Seine, France) Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 15th, Marseille, France, Nov. 7-9, 1978, Paper 11 p. 10 refs. In French Research supported by the Direction Technique des Constructions Aeronautiques

Test tools and facilities developed to analyze flows encountered on helicopter rotor blades are presented. The measurements performed on straight or 30 deg swept blade tips reveal unsteady and three-dimensional effects on absolute pressure distributions. The experimental data are also compared with calculations, which make it possible to sum up the state of art for available prediction methods. (Author)

A79-32296 # Study of compressor aeroelastic instabilities in a linear cascade wind tunnel (Etude des instabilités aéroélastiques des compresseurs en soufflerie de grille rectiligne d'aubes) E Szechenyi, H Loiseau (ONERA, Châtillon sous-Bagneux, Hauts-de-Seine, France), and B Maquennehan (SNECMA, Moissy-Cramayel, Seine-et Marne, France) (NATO, AGARD, Symposium on Stresses, Vibrations, Structural Integration and Engine Integrity, Cleveland, Ohio, Oct 23-27, 1978) ONERA, TP no 1979-6, 1979 13 p 6 refs In French

A new linear cascade wind tunnel permits simulation of subsonic and transonic flows up to angles of attack of 12 deg and supersonic flows at fixed Mach numbers through the use of interchangeable nozzles. First tests in the new facility have revealed several types of flutter. A parametric study shows the effect of reduced frequency, angle of attack, pitch axis position, and Mach number.

PTH

A79-32302 # Dynamic identification of light aircraft structures and flutter certification (Identification dynamique des structures d'avions légers et leur certification au flottement) G Piazzoli and J-L Meurzec (ONERA, Châtillon sous Bagneux, Hauts-de-Seine, France) (NATO, AGARD, Meeting, 48th, Williamsburg, Va, Apr 1-6, 1979) ONERA, TP no 1979-31, 1979 20p In French

The paper reviews some methods of quick identification of light aircraft structures and presents some of the calculation methods used Special attention is given to mixed methods, based on theoretical reconstruction of the contributions of the control surfaces in the structural modes revealed in tests, with a view to reducing the bad effects due to orthogonalization of the experimen tall mode basis with which the flutter prediction calculations were made

A79-32305 # Cost-effective production of flight vehicle shells by the pressure and flow-pressure processes (Kostengunstige Herstellung von Flugkorpergehausen im Druck- und Fliessdruckverfahren) R Baumgartner (Messerschmitt-Bolkow-Blohm GmbH, Ottobrunn, West Germany) Deutsche Gesellschaft fur Luft- und Raumfahrt, Symposium über wirtschaftliche Herstelltechniken, Cologne, West Germany, Mar 28, 1979, Paper 79-008 10 p in German

The paper describes two cold forming processes, the pressure and the flow-pressure methods, used to fabricate thin-walled tubular or ogive shell parts for flight vehicles. The flow-pressure method has the advantage that eccentricities are eliminated. Cheaper material can be used. Long components with a bottom can be produced without welding. A major disadvantage is that because of the spii al-shaped internal stresses, ovality appears during unilateral unloading. P.T.H.

A79-32307 # Economical processing of fiber-reinforced components with thermal expansion molding (Wirtschaftliche Fertigung von Faserverbundbauteilen mit der Gummi-Expansions-Technik) K Schneider (Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, West Germany) Deutsche Gesellschaft für Luft und Raumfahrt, Symposium über wirtschaftliche Herstelltechniken, Cologne, West Germany, Mar 28, 1979, Paper 79-011 33 p in German

The economic advantages in processing CFRP structures with thermal expansion molding are demonstrated on the example of a civil aircraft aileron consisting of 5 ribs, spars, and a cover layer. It is shown that in a large-scale application of the technique there is a 25% gain in costs, and a 65% saving in material components. A A

A79-32329 * # An off-design correlation of part span damper losses through transonic axial fan rotors W B Roberts (Nielsen Engineering and Research, Inc., Mountain View, Calif.), J E Crouse, and D M Sandercock (NASA, Lewis Research Center, Cleveland, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-6 15 p. 21 refs Members, \$1 50, nonmembers, \$3 00 Grant No NsG-3133

The experimental performance of 10 transonic fan rotors was used to correlate losses caused by midchord part-span dampers (PSD) during off design operation between 50 and 100 percent of design speed. The design tip speed for the rotors used varied from 419 to 425 m/s and the design pressure ratios from 1 6 to 2 0. The loss attributable to the damper and the region influenced along the blade height was correlated with relevant aerodynamic and geometric parameters. The losses at the design point were estimated by a previously reported correlation (Roberts, 1978). Using this as a base, the off-design losses were correlated with variation in blade suction surface incidence. A check with independent data showed that the prediction of damper losses and region of influence was fair to good for most of the off-design data examined. (Author)

A79-32330 # Design and testing of two supercritical compressor cascades H Rechter, P Schimming, and H Starken (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Antriebstechnik, Cologne, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-11 11 p 7 refs Members, \$1 50, nonmembers, \$3 00

Two highly loaded supercritical compressor cascades (SKG 1 3 and SKG 2 7) have been designed and tested in order to demonstrate the applicability of supercritical airfoil technology to turbomachinery blading. The blade geometry was calculated by an inverse numerical method starting from a prescribed velocity triangle and a blade surface pressure distribution which has been optimized through boundary layer calculations. The cascade test results confirmed that supercritical airfoil technology is applicable to compressor bladings. At design point conditions, minimum losses were found for both cascades, whereas the off-design performance was not satisfactory for the SKG 1 3 cascade. To improve this, the second cascade SKG 2 7 has been developed with a modified pressure distribution. This resulted in a considerably broader low-loss range with respect to inlet Mach numbers, whereas the incidence range could only be enlarged by 2 deg.

A79-32334 # A low cost, on-site performance monitoring system H I H Saravanamuttoo (Carleton University, Ottawa, Canada) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-21 6 p Members, \$1 50, nonmembers, \$3 00 Research supported by the National Research Council of Canada

A simple thermodynamic analysis for on-site performance monitoring of shaft power gas turbines is described. The method is simple, requires minimal extra instrumentation, yet permits the operator to determine the critical cycle parameters of turbine inlet temperature and airflow. Computing requirements can be handled by a programmable calculator at minimum cost Experimental verification of the system showed very good agreement with engine tests.

(Author

A79-32342 # Shock boundary layer interaction on high turning transonic turbine cascades C G Graham (Rolls-Royce, Ltd., Aero Div., Bristol, England) and F H Kost (Aerodynamische Versuchsanstalt Gottingen, Gottingen, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12.15, 1979, 79-GT-37. 13 p. 12 refs. Members, \$1.50, nonmembers, \$3.00

The paper presents the initial results of a cascade research program initiated in 1975 by Rolls Royce to provide information on the performance of transonic turbine profiles and, in particular, on the effect of shock boundary layer interaction. Two different rotor blade profiles are designed to investigate the effect of blade back curvature on transonic blade performance. The results are interpreted using Schlieren photographs to relate the transonic flow behavior to the cascade performance. The suitability of Schlieren optics flow visualization for evaluating the results is discussed.

A79-32343 # Measurements of heat transfer in circular, rectangular and triangular ducts, representing typical turbine blade internal cooling passages using transient techniques R W Ainsworth (Atomic Energy Research Establishment, Engineering Sciences Div., Harwell, Oxon, England) and T V Jones (Oxford University, Oxford, England) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar 12-15, 1979, Paper 79 GT-40 8 p. 16 refs Members, \$1 50, nonmembers, \$3 00 Research supported by the Ministry of Defence (Procurement Executive) and Rolls Royce, Ltd

Internal convection cooling of turbine blades and nozzle guide vanes in jet engines is a method used to prolong the life of those components, which are subjected to very high temperature flows from the engine's combustion chambers. The cooling is effected by passing cold gas through the internal coolant passages situated in the core of the components, the shape of these passages in many cases being simple duct geometries. Experiments are described in which transient techniques were used in an internal flow facility to measure the flow property variation and heat transfer in various geometries simulating typical internal coolant passages, at conditions representative of those found in engines. Results obtained from the three geometries studied (circular, rectangular, and triangular ducts) are compared with existing experimental data and an integral-approach theoretical prediction. In addition, flow in the circular duct with mass removal representing film cooling mass flow was also studied experimentally, and these results are compared with theoretical predictions (Author)

A79-32348 # An application of 3 D viscous flow analysis to the design of a low-aspect-ratio turbine H C Liu, T C Booth (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz), and W A Tall (USAF, Aero Propulsion Laboratory, Wright Patterson AFB, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79 GT-53 9 p 8 refs Members, \$1 50, nonmembers, \$3 00 USAF sponsored research

Previously reported cascade test results verified and provided a calibration of the 3 D viscous flow analysis. This paper describes the subsequent AFAPL sponsored technology program in which the 3-D viscous flow computer program was used to optimize the low-aspect ratio stator of a high-work turbine stage. The optimization procedure, in conjunction with the radial distribution of energy extraction, led to innovative-but-realistic blading for advanced gas generator turbines. A turbine stage was tested with this stator, in conjunction with an appropriate rotor design. The total to-total design point efficiency - 92 percent at 1 percent to clearance - was achieved at 31.83 Btu/lbm specific work. In addition to stage tests, separate stator tests were conducted including a measurement of total pressure loss and stator reaction torque, which provided baseline data to assess interaction effects during stage testing with stator reaction measurements 'in vivo'.

(Author)

A79-32350 # Unsteady upstream effects in axial-flow supersonic compressor stages H E Gallus, K D Broichhausen (Aachen, Rheinisch Westfalische Technische Hochschule, Aachen, West Germany), and D Bohn (Kraftwerk Union AG, Mulheim, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12 15, 1979, Paper 79 GT-55 9 p 18 refs , Members, \$1 50, nonmembers, \$3 00

An investigation of the unsteady flow effects in a supersonic compressor stage is reported. Semiconductor transducers mounted in the casing, a stroboscopic schlieren technique and probes equipped with semiconductor transducers were used to obtain unsteady static pressure, flow visualization and three dimensional flow information, respectively. The throttling effect during the starting procedure of the stage was found to produce changes of the quasi steady and unsteady rotor flow pattern as well as changes in both amplitude and frequency of the flow disturbances at the inlet. The conditions which are generated in this way at design speed are different from those reached by back pressure imposed on the started supersonic rotor at

the same speed. The relative position of rotor and stator has an influence on the flow field only below design speed. One can conclude from the measurements of the rotor outlet angle that these effects generated by throttling the rotor flow by a stator during the starting procedure might be avoided with movable stator blades.

(Author)

A79-32351 * # Laser balancing demonstration on a high-speed flexible rotor R S DeMuth, R A Rio (Mechanical Technology, Inc., Latham, NY), and D P Fleming (NASA, Lewis Research Center, Seals and Rotor Dynamics Section, Cleveland, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar 12-15, 1979, Paper 79-GT-56 6 p 6 refs Members, \$1 50, nonmembers, \$3 00 Contract No NAS3-18520

This paper describes a flexible rotor system used for two-plane laser balancing and an experimental demonstration of the laser material removal method for balancing. A laboratory test rotor was modified to accept balancing corrections using a laser metal removal method while the rotor is at operating speed. The laser setup hardware required to balance the rotor using two correction planes is described. The test rig optical configuration and a neodymium glass laser were assembled and calibrated for material removal rates. Rotor amplitudes before and after balancing, trial and correction weights, rotor speed during operation of laser, and balancing time were documented. The rotor was balanced through the first bending critical speed using the laser material removal procedure to apply trial weights and correction weights without stopping the rotor.

(Author)

A79-32353 # A general solution for distorted flows in cascades of aerofoils M A El-Attar (Arab Organization for Industrialization, Helwan, Egypt) and R E Peacock (Cranfield Institute of Technology, Cranfield, Beds, England) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT 65 14 p 15 refs Members, \$1 50, nonmembers, \$3 00

The response of aerofoils in cascades to maldistributed inlet flows has been subject either to small perturbation analysis and to an actuator disk type of solution. Such solutions are not able to account for realistic blade geometry or for significant flow variations over one blade pitch. The general solution presented is capable of handling not only blade geometries involving large camber and chordwise thickness variation but accommodates the interference effect of adjacent blades in the presence of large and arbitrary shear intensity. The main contribution of this work is the development of a nonlinear theory for nonuniform inviscid and incompressible cascade shear flow. The theory is applied to results from experiments with an isolated aerofoil in shear flow and an encouraging level of agreement is found.

A79-32364 # Aerodynamic design of fixed and variable geometry nozzleless turbine casings P M Chapple, P F Flynn, and J M Mulloy (Cummins Engine Co., Columbus, Ind.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar. 12-15, 1979, Paper GT-87 7 p. 12 refs. Members, \$1.50, nonmembers, \$3.00

A design method has been developed to produce nozzleless turbine casings which provide a centrifugal turbine wheel with a uniform inlet state. The analysis includes the effect of wall friction and has been found to accurately predict the mass flow versus pressure ratio characteristics of nozzleless casings. The uniform inlet state provided by this design approach provides turbine wheel/casing configurations with near optimum efficiency and a very low aerodynamic blade vibration excitation level. The model has been extended to produce variable area casings to simulate a simplified variable casing geometry. Testing has verified the accuracy of the approach both in the design point and variable geometry cases. Also

depicted are new insights into turbine wheel design constraints discovered when using a variable geometry turbine casing (Author)

A79-32368 # Surge-induced structural loads in gas turbines R S Mazzawy (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.). American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-91.7 p. 8 refs. Members, \$1.50, nonmembers, \$3.00

The axial flow compression system of a modern gas turbine engine normally delivers a large quantity of airflow at relatively high velocity. The sudden stoppage (and reversal) of this flow when an engine surges can result in structural loads in excess of steady state levels. These loads can be quite complex due to inherent asymmetry in the surge event. The increasing requirements for lighter weight engine structures, coupled with the higher pressure ratio cycles required for minimizing fuel consumption, make the accurate prediction of these loads an important part of the engine design process. This paper is aimed toward explaining the fluid mechanics of the surge phenomenon and its impact on engine structures. It offers relatively simple models for estimating surge induced loads on various engine components. The basis for these models is an empirical correlation of surge-induced inlet overpressure based on engine pressure ratio and bypass ratio. An approximate estimate of the post-surge axial pressure distribution can be derived from this correlation by assuming that surge initiation occurs in the rear of the compression system (Author)

A79-32371 # Starting torque characteristics of small aircraft gas turbines and APU's C Rodgers American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-95 8 p 10 refs Members, \$1 50, nonmembers, \$3 00

Rapid starting at ambient temperatures as low as 65 F is often stipulated for small aircraft gas turbines and auxiliary power units Lubricant viscous drag in the mechanical drive train and accessories largely controls the starting torque characteristics of cold engines, the viscous drag is related to the magnitude of the applied start torque. The weight of hydraulic start systems for auxiliary power units may nearly equal that of the unit itself. A synergistic approach to starting torque characteristics is suggested to improve small gas turbine design.

A79-32375 # An experimental study of endwall and airfoil surface heat transfer in a large scale turbine blade cascade R A Graziani, M F Blair, J R Taylor (United Technologies Corp., East Hartford, Conn.), and R E Mayle (Rensselaer Polytechnic Institute, Troy, N Y) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-99 11 p 21 refs Members, \$1 50, nonmembers, \$3 00

Local rates of heat transfer on the endwall, suction, and pressure surfaces of a large scale turbine blade cascade were measured for two inlet boundary layer thicknesses and for a Reynolds number typical of gas turbine engine operation. The accuracy and spatial resolution of the measurements were sufficient to reveal local variations of heat transfer associated with distinct flow regimes and with regions of strong three-dimensional flow. Pertinent results of surface flow visualization and pressure measurements are included. The dominant role of the passage vortex, which develops from the singular separation of the inlet boundary layer, in determining heat transfer at the endwall and at certain regions of the airfoil surface is illustrated. Heat transfer on the passage surfaces is discussed and measurements at airfoil midspan are compared with current finite difference prediction methods. (Author)

A79-32378 # The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor K Bammert (Hannover, Technische Universität, Hanover,

West Germany) and G U Woelk (Gutehoffnungshutte Sterkrade AG, Oberhausen, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-102 5 p 6 refs Members, \$1 50, nonmembers, \$3 00

The conversion of energy in an axial compressor is influenced in great measure by the surface quality of the blading. To achieve low flow losses, the roughness values of the blade surface must be below certain limits. However, the blade surface, which is hydraulically smooth on commissioning of the machine, is in many cases attacked by dirt, corrosion and erosion during operation. For investigation of the influence of the surface quality on the efficiency, flow rate, pressure ratio, and the shifting of the characteristic curves, systematic measurements were taken on a three-stage axial compressor with smooth and uniformly rough blading. The roughness was produced by applying loose emery grain of different grades. (Author)

A79-32383 # Forced vibrations of a single stage axial compressor rotor J A Fabunni (Kaman Aerospace Corp., Bloomfield, Conn.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-108. 7 p. 13 refs. Members, \$1.50, nonmembers, \$3.00

A semi empirical method, utilizing modal analysis based on experimentally obtained modeshapes has been used to study the vibration response of a 23 bladed axial compressor rotor. The system modeshapes, characterized by the blade deflections at resonance, are more or less irregular depending upon the proximity of the system frequencies to the blade cantilever frequencies. The response of the detuned bladed disk assembly to various types of harmonic excitations are shown to be predictable if sufficient experimental information is available about the resonant modes and frequencies of the system.

(Author)

A79-32384 # Friction damping of resonant stresses in gas turbine engine airfoils J H Griffin (United Technologies Corp., Government Products Div., West Palm Beach, Fla.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-109 5 p. 7 refs. Members, \$1.50, nonmembers, \$3.00

An approximate solution is presented to the problem of determining the resonant response of a turbine blade with a blade-to-ground damper. The approach assumes that the damper is characterized by two parameters the force at which it slips, and its stiffness. The effect of these parameters on the resonant response is assessed both analytically and experimentally. Good agreement is found between theory and experiment. The results suggest that the maximum amount of friction damping that can be achieved is an inherent property of the blade geometry. Hence, by considering the derived amplitude reduction formula, it is possible to establish guidelines that can be applied in the early stages of blade design. S.D.

A79-32385 # The time-variant aerodynamic response of a stator row including the effects of airfoil camber S Fleeter, W A Bennett, and R L Jay (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, Ind.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT 110. 9 p. 7 refs Members, \$1.50, nonmembers, \$3.00 USAF sponsored research

The paper outlines an experimental research program for quantitative determination of the validity and applicability of state-of-the-art transverse gust cascade analyses. The rotor wake generated harmonic time-variant pressure distributions on both a classical flat plate and a cambered airfoil stator row are determined over a wide range of incidence angle values at realistic reduced frequency. These dynamic data are all correlated with piedictions obtained from a state-of the art compressible, zero incidence, flat plate cascade, transverse gust analysis with a view to determine its range of validity and to quantitatively assess the effects of airfoil

camber It is shown that compressibility is significant at high reduced frequency and low Mach number values, that the zero-incidence flat plate vane data correlate very well with the compressible flat plate predictions, and that the zero-incidence cambered airfoil vane row dynamic pressure coefficient data correlate well with the compressible flat plate prediction over the entire vane chord, and that the effect of airfoil camber is to increase the aerodynamic phase lag over the rear portion of the vane. Other conclusions are also reported

SI

A79-32386 # Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach number I - Pressure distribution, forces, and moments. H Atassi and T J Akai (Notre Dame, University, Notre Dame, Ind) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-111 8 p 11 refs Members, \$1 50, nonmembers, \$3 00 Grant No AF AFOSR-74-2675

An analytical solution is introduced which accounts for the singular behavior of the mean velocity gradient of oscillating cascaded airfoils in uniform incompressible flows. The numerical procedure is such that all the terms of the boundary conditions at the airfoil surface are properly and completely considered. Attention is given to a study of the unsteady pressure distribution, forces and moments for typical airfoil geometry and cascade parameters, and the results are compared with cases examined previously. The basic characteristics of the unsteady pressure near the leading edge are investigated in view of its importance to flow separation and bubble formation. It is shown that the strong mean velocity gradient near the leading edges of the airfoils significantly affects the unsteady pressure, forces and moments acting on the airfoils.

A79-32387 # Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach number II - Stability and flutter boundaries J T Akai and H Atassi (Notre Dame, University, Notre Dame, Ind) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-112 5 p 11 refs Members, \$1 50, nonmembers, \$3 00 Grant No AF-AFOSR-74-2675

The aerodynamic coefficients obtained from the analysis developed in Part I of this paper are utilized here to investigate stability and flutter boundaries for loaded cascades of airfoils with finite thickness. Combined bending and torsional oscillations for different stiffness ratios are studied for compressor and turbine cascades. The results show very significant effects of blade geometry and mean flow incidence on the stability and flutter boundaries. These effects are basically the consequence of strong coupling between the steady and unsteady aerodynamics of the cascade.

(Author)

A79-32389 # Nuclear Bi-Brayton system for aircraft propulsion- B L Pierce (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-119. 10 p. 7 refs. Members, \$1.50, nonmembers, \$3.00 Contract No F33615 77-C-0116.

Recent studies have identified and shown the desirability of a new system concept for nuclear aircraft propulsion utilizing a modification of a closed-cycle gas turbine. This system concept, the Bi-Brayton system concept, permits coupling of a gas cooled reactor to the power transmission and conversion system in a manner such as to fulfill the safety criteria while eliminating the need for a high temperature intermediate heat exchanger or shaft penetrations of the containment vessel. This system has been shown to minimize the component development required and to allow reduction in total propulsion system weight. This technical paper presents a description of the system concept and the results of the definition and evaluation studies to date. Parametric and reference system definition as studies have been performed. The closed-cycle Bi Brayton system and component configurations and weight estimates have

been derived Parametric evaluations and cycle variation studies have been performed and interpreted. The technical paper discusses the application of this new closed cycle gas turbine system to aircraft propulsion.

(Author)

A79-32392 # Performance estimation of partial admission turbines K Korematsu (Kogakuin University, Tokyo, Japan) and N Hirayama (Tokyo Metropolitan University, Tokyo, Japan) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-123 9 p 6 refs Members, \$1 50, nonmembers, \$3 00

The new relationships of partial admission losses which account for influence of all major geometric parameters of concern to the turbine designer are presented, based on fluid dynamic analysis of the losses. The performance maps are presented showing the trends in efficiencies that are attainable in turbine designed over a wide range of loading, axial velocity/blade speed ratio, Reynolds number, and aspect ratio. Finally, the question of partial admission versus low aspect ratio is discussed. (Author)

A79-32393 # Modal analysis of gas turbine buckets using a digital test system H A Nied (General Electric Co , Gas Turbine Div , Schenectady, N Y) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-124 12 p 14 refs Members, \$1 50, nonmembers, \$3 00

A modal analysis was conducted on gas turbine buckets using a digital Fourier analyzer. This digital test/computer system measures a set of frequency response functions for broadband impulse excitation at successive locations on the bucket airfoil. From the set of frequency response functions, the analyzer computes the modal parameters used to determine the natural frequencies, critical damping ratio and mode shapes of the turbine buckets. An animated display of the mode shapes for a discrete experimental model graphically revealed compound modes due to coupling. The test has shown that the digital modal analysis using the impulse excitation techniques is rapid and precise experimental method to determine the modal parameters of turbine buckets with a high degree of repeatability. (Author)

A79-32394 # Optimization for rotor blades of tandem design for axial flow compressors K Bammert (Hannover, Universität; Hanover, West Germany) and R Staude (Gutehoffnungshutte Sterkrade AG, Oberhausen, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-125 7 p 8 refs Members, \$1 50, nonmembers, \$3 00

The tandem cascades investigated consist of two retarding cascades closely arranged behind one another. The influences of the flow interference for the pressure distribution at the profiles, for the losses and the outlet angle are discussed. Various cascade configurations are theoretically and experimentally investigated to find out the optimum range of the axial spacing and for the displacement in circumferential direction. An example shows how rotor blades of tandem design can be optimized for minimal profile losses. The aim is to find the optimum configuration for each of the design sections of the rotor blades. A further condition is to avoid additional bending stresses due to centrifugal forces, so that tandem rotor blades can run with relatively high speed.

A79-32395 # An analysis of aeroengine fan flutter using twin orthogonal vibration modes. R A J Ford and C A Foord (Rolls-Royce, Ltd, Advanced Research Laboratory, Derby, England) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar 12-15, 1979, Paper 79-GT-126 6 p 6 refs Members, \$1 50, nonmembers, \$3 00

Aeroengine fan flutter is analyzed in terms of twin orthogonal vibration modes (independent vibrations which are similar in shape

but have slightly different natural frequencies) and simplified aerodynamic theory. Published flutter analyses use advanced aerodynamic models, but with simplified mechanical models. The present approach shows that aspects of fan vibration which are ignored by the simplified models can significantly alter flutter behavior. Flutter onset speed is shown to be affected by the natural frequency ratio of the two modes, as well as by the existing degree of damping. Blade behavior is nonuniform around the fan, and the nature and extent of the nonuniformity is determined by the natural frequency ratio of the two modes and the degree of total damping in each mode (aerodynamic plus mechanical).

A79-32398 * # Low-turbulence high speed wind tunnel for the determination of cascade shock losses J A Slovisky (Notre Dame, University, Notre Dame, Ind.), W B Roberts (Nielsen Engineering and Research, Inc., Mountain View, Calif.), and D M Sandercock (NASA, Lewis Research Center, Fan and Compressor Branch, Cleveland, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-129 11 p 23 refs. Members, \$1.50, nonmembers, \$3.00

A low turbulence high speed wind tunnel, using anti-turbulence screening and a 100 1 contraction ratio, has been found suitable for high-speed smoke flow visualization. The location and strength of normal, oblique, and curved shock waves generated by transonic or supersonic wind tunnel flow over airfoils or through axial compressor cascades is determined by combined shadowgraph and smokelines visualization techniques without the interference effects caused by intrusive probes. The Reynolds number based on chord varied between 50,000 and 1,000,000. Preliminary results are compared with the relevant theory and data gathered using a total pressure probe.

(Author)

A79-32402 # Oil squeeze film dampers for reducing vibration of aircraft gas turbine engines T Miyachi (National Aerospace Laboratory, Tokyo, Japan), S Hoshiya, Y Sofue, M Matsuki, and T Torisaki (Aircraft Noise and Emission Research Group, Tokyo, Japan) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12 15, 1979, Paper 79-GT-133 11 p 10 refs Members, \$1 50, nonmembers, \$3 00

Theoretical analysis and experiments were carried out on cylindrical oil squeeze film dampers. The finite element method (FEM) was applied for calculating pressure distribution in the dampers with end seals and oil grooves. Measurements of the viscous damping coefficient of several dampers were conducted and compared with theoretical values. The effects of the dampers on the vibrational characteristics of engines were reviewed through theoretical analysis and experiments on an engine model. Then, the effects of squeeze film dampers on an actual engine were evaluated for design information. (Author)

A79-32405 # A review of small gas turbine combustion system development J A Saintsbury and P Sampath (Pratt and Whitney Aircraft of Canada, Ltd., Montreal, Canada) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-136 10 p. 13 refs. Members, \$1.50, nonmembers, \$3.00

The EPA aircraft emission regulations were promulgated in 1973 and resulted in urgent investigations of many approaches aimed at reducing gas turbine emissions with minimum penalties to normal combustion performance. The impact of this work on small aircraft gas turbine engines is discussed, and emission reduction techniques and data are presented. Unique problems experienced with smaller gas turbine combustion systems are reviewed as are the potential difficulties of developing higher performance small combustors in the future, without the benefit of the complex and costly mechanical approaches which are applicable to the larger engines. The impact of

relaxed fuel specifications and alternate-source gas turbine fuels is discussed in terms of altered fuel properties and development of fuel injection technology (Author)

A79-32409 # Thermal influences in gas turbine transients - Effects of changes in compressor characteristics N R L MacCallum (Glasgow, University, Glasgow, Scotland) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-143 8 p 17 refs Members, \$1 50, nonmembers, \$3 00

During transients of axial-flow gas turbines, the characteristics of the compressor are altered. The changes in these characteristics (excluding surge line changes) have been related to transient heat transfer parameters, and these relations have been incorporated in a program for predicting the transient response of a single-shaft aero gas turbine. The effect of the change in compressor characteristics has been examined in accelerations using two alternative acceleration fuel schedules. When the fuel is scheduled on compressor delivery pressure alone, there is no increase in predicted acceleration times. When the fuel is scheduled on shaft speed alone, the predicted acceleration times are increased by about 5 to 6 percent. (Author)

A79-32411 # Relationships for nozzle performance coefficients E W Beans (Toledo, University, Toledo, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-145 7 p Members \$1 50, nonmembers, \$3 00

The relationships between the performance coefficients for flow, kinetic energy, and thrust are developed for the irreversible adiabatic flow through a choked nozzle. The basis of the development is maximium flowrate per unit area and an exit pressure greater than or equal to the exhaust pressure. The relationships cannot be presented in explicit mathematical form. However, from the application of linearizing techniques, linear relationships have been developed, which are accurate to within 0.1 percent. The relationships allow one to determine two performance coefficients from empirical data for a single coefficient. The relationships also allow one to predict difficult to measure flow properties such as the exit plane pressure for a choked nozzle. The applicability of the development to supersonic and unchoked nozzles is discussed.

(Author)

A79-32414 * # Elastomer mounted rotors - An alternative for smoother running turbomachinery J A Tecza, S W Jones, A J Smalley (Mechanical Technology Inc, Latham, N Y), R E Cunningham (NASA, Lewis Research Center, Cleveland, Ohio), and M S Darlow American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-149 6 p 25 refs Members, \$1 50, nonmembers, \$3 00 NASA-sponsored research

This paper describes the design of elastomeric bearing supports for a rotor built to simulate the power turbine of an advanced gas turbine engine which traverses two bending critical speeds. The elastomer dampers were constructed so as to minimize rotor dynamic response at the critical speeds. Results are presented of unbalance response tests performed with two different elastomer materials These results showed that the resonances on the elastomer-mounted rotor were well damped for both elastomer materials and showed linear response to the unbalance weights used for response testing Additional tests were performed using solid steel supports at either end (hand-mounted), which resulted in drastically increased sensitivity and nonlinear response, and with steel supports in one end of the rotor and the elastomer at the other, which yielded results which were between the soft- and hard-mounted cases. It is concluded that elastomeric supports are a viable alternative to other methods of mounting flexible rotors, that damping was well in excess of predictions and that elastomeric supports are tolerant of small rotor misalignments (Author)

A79-32418 # Effect of interblade phase angle and incidence angle on cascade pitching stability F O Carta and A O Saint

Hilaire (United Technologies Research Center, East Hartford, Conn.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-G7-153. 6 p. 15 refs. Members, \$1.50, nonmembers, \$3.00. Contract. No. N00014-75 C 1143. Project SQUID.

A comprehensive test program was conducted at low subsonic velocity on a linear cascade of airfoils oscillating in pitch about their midchords for incidence angles up to 10 deg, reduced frequencies up to 0 193, and over a range of interblade phase angles (sigma) from 60 to plus 60 deg. For the range of parameters tested it was found that the interblade phase angle is the most important parameter affecting the stability of oscillating cascaded airfoils. The system was unstable for most positive values of sigma over the entire range of loading and frequency. System stability for negative values of sigma was more dependent on loading and frequency and conformed more closely to the observed behavior of stalled flutter.

A79-32425 # Engine evaluation of a vibration damping treatment for inlet guide vanes J P Henderson (USAF, Materials Laboratory, Wright Patterson AFB, Ohio), L C Rogers, D B Paul (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio), and M L Parin (3M Co , St Paul, Minn) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-163 9 p Members, \$1 50, nonmembers, \$3 00

Welded titanium inlet guide vanes in an Air Force turbojet engine, have been experiencing a high rate of vibration induced cracking after very short service. The cause of this cracking has been identified as resonant vibration excited by pressure fluctuations occurring when the first-stage fan blades pass the inlet guide vanes. A bonded vibration damping wrap has provided a cost effective fix which can be applied on a retrofit basis for major cost savings. The damping wrap, which consists of multiple layers of energy dissipating adhesives separated by constraining layers of aluminum foil, is bonded to the vanes under high temperature and pressure in an autoclave This paper describes the results of engine test-cell tests and the comparison of these results with actual service experience obtained under operational conditions. Measured effects on engine performance, distortion tolerance, and anti-icing performance are presented along with measured stress reductions, as compared with increases in modal damping

A79-32426 # The growth and evolution of the TPE331 J -P Frignac and E J Privoznik (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-164 7 p Members, \$1 50, nonmembers, \$3 00

This paper describes the evolution of the Garrett-AiResearch TPE331 turboprop engine. It discusses the reasoning behind the original design and describes the subsequent growth of the engine from 575 to 1040 hp within the same engine frame size. The performance of the various models and the design features that provided minimum fuel consumption and maximum reliability are also discussed. (Author)

A79-32427 # The effect of a sample lot of fuel JECTORS on emissions levels of a small gas turbine G Opdyke, Jr (Avco Corp, Avco Lycoming Div, Stratford, Conn) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-G7-165 11 p 12 refs Members, \$1 50, nonmembers, \$3 00

The paper discusses the variability of emissions data measured in a test program where the fuel injectors were the prime test variable A single small gas turbine engine was tested twenty times within one month for emission levels. The different fuel manifold and injector assemblies were tested. Replicate tests were run and fuel type was varied as well. The tests conducted indicate a significant variation in hydrocarbon and carbon monoxide emissions when fuel injectors are

interchanged. It is postulated that the variability of emissions is due mainly to large drops in the fuel sprays reaching and becoming entrapped in the wall cooling film, and that the number of large drops above a critical size varies among individual fuel injectors because of normal manufacturing tolerances.

A79-32435 # The combustion of a range of distillate fuels in small gas turbine engines E Carr (Lucas Aerospace, Ltd., Fabrica tions Div., Burnley, Lancs., England) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference. San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-175. 9 p. 5 refs. Members, \$1.50, nonmembers, \$3.00

A compact engine configuration is obtained on small gas turbine engines by the use of a reverse flow annular combustion system Such combustion systems are usually of narrow width and of relatively large flame tube surface area/volume ratio. In consequence, there is a tendency for excessive concentrations of fuel near to the flame tube internal surfaces and fuel impingement on the flame tube which can give rise to performance deficiencies, such as carbon build, loss of efficiency at low load conditions, smoke, and metal overheating particularly with fuels similar to ASTM D 975 Type 2-D diesel. Since there is an increasing requirement for engines to operate with such heavier fuels, research and development programs were initiated to evolve an improved combustion system. The paper briefly describes the main features of these work programs and outlines the configuration evolved and the performance achieved. An arrangement has been obtained which gives a high standard of performance with fuels ranging from aviation kerosene fuel to gas oil and marine diesel

A79-32436 # Improving turbine efficiency K D Mach (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-176 5 p 8 refs Members, \$1 50, nonmembers, \$3 00

A brief description is given of the turbine cooling research conducted by the Air Force Aero Propulsion Laboratory (AFAPL), along with a more extensive outline of the AFAPL programs in turbine aerodynamics, including applications of three-dimensional flow analysis. The turbine design process consists of a cycle of preliminary aerodynamic and stress analyses, followed by detailed and elaborate analyses. The preliminary analyses are iterative and serve to delimit the various design parameters, such as the flow path, the vector diagrams, the airfoil sections, the heat load on the airfoils, the required coolant, and the stress levels. The turbine design is entering a period of rapid and profound change caused by the simultaneous advent of interactive graphics methods and a viable three-dimensional flow analysis.

A79-32438 # Fuel property effects on combustor performance C A Moses and D W Naegeli (Southwest Research Institute, San Antonio, Tex.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-178. 11 p. 13 refs Members, \$1.50, nonmembers, \$3.00. Contract No N00140-77-C-1345, Grant No DAAK70-78-C 0001

Two combustor rigs have been used to study the sensitivities of combustor operation to the physical and chemical properites of fuels Nineteen fuels including synfuels were used to accentuate the properties of concern composition, viscosity, and boiling-point distribution. Flame radiation and smoke were best correlated by hydrogen content rather than hydrocarbon structure, the soot formation was due to gas phase reactions. Lean blowout conditions were about the same for all fuels except that gasoline could be burned leaner at idle conditions Ignition limits were more sensitive to volatility than viscosity. Gaseous emissions and combustion efficiency were not significantly affected by fuel properties although some sensitivity to boiling point distribution was evident. In all

performance areas, the syncrude fuels correlated in the same ways as the petroleum-derived fuels except for the NOx emissions from the nitrogen containing shale oil fuel (Author)

A79-32440 # Practical 'on-engine' microprocessor control and monitoring systems for gas turbines N A Justice (Hawker Siddeley Dynamics Engineering, Ltd., Hatfield, Herts., England) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar 12-15, 1979, Paper 79-GT-181 17 p Members, \$1 50, nonmembers, \$3 00

With the advent of the microprocessor, the conventional hydromechanical approach is being superseded by systems mounted directly on the gas turbine engine. The paper discusses the single and twin gas turbine primary fuel control systems, along with such ancilliary controls as IGV, overspeed trip and reversionary or standby systems. Attention is focused on choice of microprocessors, input/output structures, on engine package and its scope, reliability and integrity, failure of transducer, and a practical approach. What has prevented an on-engine package before, viz vibration and temperature, is now well within the scope of the packaging engineer, because the size, weight and heat dissipation of microprocessor components are within usable limits.

A79-32441 # Three-dimensional lifting-surface theory for an annular blade row G F Homicz and J A Lordi (Calspan Advanced Technology Center, Buffalo, N Y) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT-182 15 p 25 refs Members, \$1 50, nonmembers, \$3 00 Contract No F33615-76 C-2092

A lifting-surface analysis is presented for the steady, three-dimensional, compressible flow through an annular blade row A kernel function procedure is used to solve the linearized integral equation which relates the unknown blade loading to a specified camber line. The unknown loading is expanded in a finite series of prescribed loading functions which allows the required integrations to be performed analytically, leading to a great savings in computer time. Numerical results are reported for a range of solidities and hub-to-tip ratios, comparisons are made with both two-dimensional strip theory and other three dimensional results. (Author)

A79-32442 # A design review of ceramic components for turbine engines P J Coty (USAF, Aero Propulsion Laboratory, Wright Patterson AFB, Ohio), A D Lane, J B Lee, and L J Meyer (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT-183 16 p Members, \$1 50, nonmembers, \$3 00 Contract No F33615-77 C-5171

The paper summarizes a program to evaluate the application of ceramic materials in small, limited-life turbine engines. Advanced ceramics technology is employed in the program to achieve an affordable, reliable, high-performance capability for turbine engines in a missile application. Design and material considerations are presented for ceramic rotor blades and stator vanes in addition to aerodynamic flow path analyses for ceramic components in high temperature environments. An iterative materials/design analysis was made with use of probabilistic design methods to predict the survivability of the ceramic components. Materials for both rotor blades and stator vanes were evaluated and selected based on mechanical and thermal stresses imposed by the optimum component design. A number of design concepts for the primary components are reviewed. These concepts include segmented-vane configurations and rotor airfoil shape and attachment schemes. (Author)

A79-32443 # The prediction of steady, circumferential pressure and temperature distortions in multistage axial flow compressors H Mokelke (Motoren- und Turbinen- Union Munchen GmbH

Munich, West Germany) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT 184 17 p 15 refs Members, \$1 50, nonmembers, \$3 00 Bundesministerium der Verteidigung Contracts No MTU-ZTL 4,05/7, No MTU-ZTL-4,05/8

It is desired to predict to circumferential pressure, temperature and velocity perturbations upstream, between the blade rows and downstream of a multistage, high hub-to-tip ratio axial flow compressor subjected to a steady combined total pressure/total temperature inlet flow distribution. For this purpose, an analytical model is developed which replaces the blade rows of the compressor by actuator disks located at the semichord position. Due to this arrangement of the disks, the circumferential crossflow between the blade rows is overestimated, but this is neglected. The restriction to a high hub-to-tip ratio compressor with a purely circumferential distortion allows to neglect radial variations in flow properties, so that the problem reduces to a two-dimensional one. Although the formulated theory holds only for a cylindrical annulus of zero height with a constant radius to a first degree of accuracy, it can be applied to the mean section of the compressor or separately from stream surface to stream surface

A79-32445 # Wind tunnel model study of the hot exhaust plume from the compressor research facility at Wright-Patterson Air Force Base, Ohio G R Ludwig (Calspan Advanced Technology Center, Buffalo, N Y) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif , Mar 12-15, 1979, Paper 79-GT 186 13 p 5 refs Members, \$1 50, nonmembers, \$3 00 Contract No F33615 76-C 2992

This paper presents the results of a wind tunnel model study to determine temperatures at various locations generated by the hot exhaust air from the Compressor Research Facility (CRF) which is being built at Wright Patterson Air Force Base, Ohio The study was designed to provide data at the inlet to the CRF and at other nearby locations where pedestrians, building ventilation systems, and vegetation might be affected. The test program, which was conducted in the Calspan Atmospheric Simulation Facility, included flow visualization studies and quantitative concentration measurements of a tracer gas from which full scale temperature could be calculated. The concentration measurements were performed for a number of wind speeds at each of twelve different wind directions. Two exhaust flows and two exhaust stack configurations were studied. (Author)

A79-32447 # Catalytic combustion for gas turbine applications W V Krill, J P Kesselring, and E K Chu (Acurex Corp., Energy and Environmental Div., Mountain View, Calif.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-188 8 p. 9 refs. Members, \$1.50, nonmembers, \$3.00

Developments in catalytic combustion have shown increasing potential for application in gas turbine combustors. Significant advantages in reducing combustor emissions, particularly nitrogen oxides (NOx), can be realized. Both thermal and fuel NOx control were demonstrated for a developed graded cell catalyst concept Other criteria for catalyst scaleup and high pressure operation have been developed. The concepts have been demonstrated in a catalytic model gas turbine combustor and a catalytic staged combustor. The staged combustor shows great potential for control of fuel NOx New concepts in turbine combustors are required to implement catalytic combustion technology. Gas turbine manufacturers were surveyed to identify design criteria. The established criteria were prioritized and incorporated into several conceptual designs for the combustor Ongoing development will advance the concepts to prototype demonstration (Author)

A79-32452 # Characteristic time correlations of pollutant emissions from an annular gas turbine combustor A M Mellor (Purdue University, West Lafayette, Ind.) and R M Washam

(General Electric Co, Schenectady, NY) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif, Mar 12-15, 1979, Paper 79-GT 194 6 p 16 refs Members, S1 50, nonmembers, S3 00 Research supported by the US Environmental Protection Agency

Gaseous emissions from aircraft gas turbines have been under study for about ten years. In this paper, the characteristic time model for gaseous pollutant emission (NOx, CO) from conventional gas turbine engines is applied to the Pratt and Whitney JT9D annular gas turbine combustor. Two can combustors, the GT-309 vehicular and T 63 helicopter burners, are considered for comparison purposes Attention is given to an examination of the universality of the correlations for these three gas turbine combustors. Refinements of the characteristic time model as applied to JT9D are presented. The significant new findings of the JT9D modeling effort are as follows (1) the combustor is annular but can be modeled as a can annular with CO surface area correction, (2) the burner is swirl rather than jet stabilized, which may be the cause of the small NOx correlation slope change observed. As was the case for the T-63 combustor, the model includes fuel property variations as long as heterogeneous effects are negligible

A79 32457 # Account of film turbulence for predicting film cooling effectiveness in gas turbine combustors G J Sturgess (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.) American Society of Mechanical Engineers, Gas Turbine Conference and Exhibit and Solar Energy Conference, San Diego, Calif., Mar. 12-15, 1979, Paper 79-GT-200. 16 p. 13 refs Members, \$1.50, nonmembers, \$3.00

The liners of gas turbine combustion chambers are commonly film-cooled by tangential injection of cooling air along their flame side surfaces from one or more injection devices placed axially in the liner to form individual circumferential panels. Practical geometry slots have a lower film effectiveness at ideal injection conditions than idealized slots with the same slot height and lip thickness. The coolant film is modeled as three distinct regions, and the effects of injection slot geometry on the development of each region are described in terms of film turbulence intensity and initial circumferential nonuniformity of the injected coolant. A prediction procedure for 'well designed' slots is presented which describes film growth downstream of the first of the three film regions.

A79-32581 Geodesy and coordinate conversion for position determination of aircraft (Geodésie et conversion de coordonnees pour la localisation des avions) G Maignan (EUROCONTROL, Centre Experimental, Brussels, Belgium) Navigation (Paris), vol. 27, Apr. 1979, p. 135-144, 7 refs. In French

A typical air traffic control problem in Western Europe involves the simultaneous determination of the positions of about 300 aircraft through radar measurements which may be based on different reference ellipsoids. Additional difficulties arise from the inexactness with which certain radar station locations are known. The errors in aircraft position determination resulting from the adoption of coordinate conversion techniques are examined, and the necessity of second-order approximations for some determinations is demonstrated.

A79-32582 Navigation by satellites (La navigation par satellites) E Giboin Navigation (Paris), vol 27, Apr 1979, p 145 159 In French

The Navy Navigation Satellite System, in public use since 1967, and the Navigation System with Time and Ranging/Global Positioning System (Navstar/GPS), which will enter service in 1985, are discussed Attention is also given to a French program, considered during the late 1960s, for a satellite based air traffic and marine navigation system for the North Atlantic Frequency bands, the protected and clear/acquisition codes, and the expected precision (five to six m) of the Navstar system are considered.

A79-32583 Air France's Paris-Tokyo transpolar flight in 1978 (Le vol transpolaire Air France, Paris-Tokyo, en 1978) P Hugon and J Fournier Navigation (Paris), vol 27, Apr 1979, p 180, 183-208 in French

The role of inertial navigation systems, the selection of navigation way points and the choice of cruising altitude for scheduled airline service between Paris and Tokyo are discussed. The practical limits of usefulness of magnetic compasses in the polar region are considered, and emergency procedures for cases in which inertial navigation systems fail are reviewed. The adoption of laser gyroscopes for future polar flights is also mentioned.

A79-32584 # The powered glider, SZD-45A Ogar (Motoszybowiec SZD-45A Ogar) T Labuc (Przedsiebiorstwo Doswiadczalno-Produkcyjne Szybownictwa, Bielsko-Biala, Poland) Technika Lotnicza i Astronautyczna, vol. 34, Mar. 1979, p. 9-12. In Polish

The incorporation of a Stark 45 SG engine, provided by the firm Kuhn, West Germany, into a glider, manufactured by the Bielsko Works, is discussed. The design of the craft is described in some detail, and its specifications are outlined.

A79-32585 # Designing aircraft shock absorbers (Projektowanie amortyzacji samolotu) J Perlinski *Technika Lotnicza i Astronautyczna*, vol 34, Mar 1979, p. 12 14 19 refs. In Polish

The present paper deals with landing gear dynamics and the parameters which affect the aircraft at touch down and during the landing run. The problem of designing landing gears for landing load requirements is examined.

A79-32586 # Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A (Badania odpornosci na termozmeczenie aluminiowanych i niealuminiowanych lopatek turbin silnikow odrzuto wych wykonanych ze stopu nimonic 80A) Z Raczynski (Rzeszow, Politechnika, Rzeszow, Poland), R Szurlej, and L Wasko (Wytwornia Sprzetu Komunikacyjnego, Panstwowy Zaklad Lotniczy, Rzeszow, Poland) Technika Lotnicza i Astronautyczna, vol 34, Mar 1979, p 25, 26 In Polish

A79-32588 # Numerical representation of aircraft geometry (Numeryczne odwzorowanie geometrii samolotu) W Adamski *Technika Lotnicza i Astronautyczna*, vol 34, Mar 1979, p 29-31 7 refs In Polish

The paper deals with the numerical representation of curves and surfaces for use in shaping external aircraft parts. Criteria for curve and surface fitting are proposed, along with a program for calculating surface coordinates on an arbitrary cross-sectional plane.

A79-32589 # Selected problems concerning unstable operation of aircraft turbine engine compressors (Wybrane problemy niestatecznej pracy sprezarek lotniczych silnikow turbinowych) J Borgon Technika Lotnicza i Astronautyczna, vol 34, Mar 1979, p 33 35 5 refs In Polish

The paper deals with causes and mechanisms of instability of aircraft gas turbine compressors. The symptoms and effects of compressor instability on the ground and in flight are discussed, along with methods of preventing instability.

A79-32590 Numerical analysis of flow through turbine cascades by the Modified FLIC Method T Nagayama, T Adachi, Y Hayashi, and E Miyata (Mitsubishi Heavy Industries, Ltd., Nagasaki Technical Institute, Nagasaki, Japan) Mitsubishi Heavy Industries Technical Review, vol. 15, Oct. 1978, p. 189-194. 7 refs

This paper presents a numerical method used for the calculation of flow through turbine cascades. Named the Modified FLIC Method, this numerical method uses the triangular finite difference mesh pattern which is different from the rectangular mesh pattern used for the conventional FLIC method. Time-marching technique is

used, that is, starting with a given flow distribution, the calculation is repeated until a steady-state solution is obtained. The computer program based on this method is very effective, for instance, the program has reduced the amount of work required for preparing input data in order to use automatic triangular mesh generation algorithm and it is capable of giving graphic results of calculation. The results of the numerical calculation are compared with the optical experimental data obtained by using a shock tunnel. It is found that there are satisfactory agreements between the calculated results and the experimental results. (Author)

A79-32670 # The flow past a supersonic trailing edge in transonic turbine cascades R Dvorak, P Safarik, and V Vlcek (Ceskoslovenska Akademie Ved, Ustav Termomechaniky, Prague, Czechoslovakia) Strojnicky Casopis, vol 29, no 3, 1978, p 260-269 7 refs

The paper discusses the importance of the base pressure in the theoretical solution of transonic cascades and in their experimental research. Results of a semiempirical investigation into the base pressure problem are presented. A comparison with other elsewhere published data is given together with an example to check the applicability of the results.

(Author)

A79-32671 # Some experimental results connected with the transonic instabilities on an airfoil V Vlcek (Ceskoslovenska Akademie Ved, Ustav Termomechaniky, Prague, Czechoslovakia) Strojnicky Casopis, vol. 29, no. 3, 1978, p. 342 354

The article describes the experimental research into the transonic instability of the flow field on an isolated airfoil and in a cascade. The generation of disturbances in separated flow, propagation of waves from these sources upstream as well as their distortion and cumulation, which can cause the motion of the terminal shock is also described. The formulas which have the direct relation to mentioned phenomena and which were obtained from the theory of propagation of weak waves and from the theory of waves of finite amplitude are given.

(Author)

A79-32722 Omega - Global navigating by VLF fix J F Kasper, Jr (Analytic Science Corp., Reading, Mass.) and C E Hutchinson (Massachusetts, University, Amherst, Mass.) *IEEE Spectrum*, vol. 16, May 1979, p. 59-63. 6 refs

The Omega VLF system, expected to provide worldwide, all-weather position fixes with root-mean-square accuracy of 1-2 nautical miles, is discussed. The evolvement of the system from World War II research on LF and VLF radiowave propagation is reviewed, together with a description of the signal format generator. The position-fixing process, and the models employed to predict the behavior of VLF signals are examined, and it is shown that the position-fixing accuracy of Omega depends mainly on the ability to predict signal phase. The program for collecting Omega phase data to support system calibration is noted, as are disruptive events, such as sudden ionospheric disturbances and polar cap absorptions. System equipment costs are mentioned.

A79-32734 # Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution (Pole izlucheniia konformnoi fazirovannoi antennoi reshetki elementov vrashchaiushcheisia polarizatsii, raspolozhennykh na poverkhnosti vrashcheniia) A A Klimashov and N P Mar'in Radioelektronika, vol 22, Feb 1979, p 66-69 In Russian

A79-32750 Simulators cutting the fuel bill M Hirst Flight International, vol. 115, Apr. 21, 1979, p. 1241 1246

The current and future state of aircraft simulators is reviewed Airliner simulators are considered, with emphasis placed on CGI (computer generated image) units currently under development. The PTT (part-task trainer) and the ACT (air-combat trainer) systems, used for military operations, are taken into account, as are

general-aviation simulators. Soviet airliner simulators, such as the Tu 154B2 and the II-62M, are noted, together with a description of a single-seat combat aircraft simulator.

A A

A79-32751 Designing, calculating, and manufacturing by means of data processing (Mit der Datenverarbeitung Konstruieren, Berechnen, Fertigen) G Lang Lendorff (Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, West Germany) VDI-Z, vol 121, no 7, Apr 1979, p 291-296 17 refs In German

The concept of the linking of tasks in the application of CAD/CAM (Computer aided design/computer aided manufacturing) is discussed CAD/CAM methods, particularly the treatment of geometrical objects, technical data base, and finite element method, are considered. It is concluded that the development of program interlinking calls for a closer cooperation between developer and user.

A A

A79-32825 Prospects of using wedge-shaped models for investigating thermal fatigue of turbine blades L V Kravchuk (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR) (Problemy Prochnosti, Aug 1978, p 82-88) Strength of Materials, vol 10, no 8, Apr 1979, p 951-957 6 refs Translation

In the present paper, the adequacy of using geometrically nonsimilar models to study the thermal endurance of structural members with thermal stress raisers is evaluated on the basis of an analysis of the thermal stress strain state of wedge shaped models. A nomogram for determining the proper dimensions of wedge shaped model (wedge angle radius of curvature of the edge, and chord length) is proposed, along with quantitative data for specifying means of controlling the thermal stress strain state of the wedge edge in the solution of modeling problems.

A79-32827 Damping capacity of paired shrouded turbine blades in relation to shroud contact conditions V V Matveev, I G Tokar', S S Gorodetskii, and A B Roitman (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR) (Problemy Prochnosti, Aug 1978, p 93-97) Strength of Materials, vol 10, no 8, Apr 1979, p 962-966 5 refs Translation

A79-32828 Evaluation of the aerodynamic damping of the oscillations of turbine blades with a view to pitch, stagger angle, and curvature of blades V A Balalaev (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR) (Problemy Prochnosti, Aug 1978, p 98-103) Strength of Materials, vol 10, no 8, Apr 1979, p 967-973 10 refs Translation

A79-32919 # Dynamic stability of a flight vehicle laying out an uncoiling line (Statecznosc dynamiczna obiektu latajacego odwijajacego z pokladu line) T Kuzmicewicz (Wojskowa Akademia Techniczna, Warsaw, Poland) and J Maryniak (Warszawa, Politech nika, Warsaw, Poland) Mechanika Teoretyczna i Stosowana, vol. 17, no. 1, 1979, p. 93-104, 21 refs. In Polish

A stability analysis is carried out for a flight vehicle (rocket) from the end of which a line uncoils into the rocket's wake. The influence of the uncoiling line, of some parameters characterizing the ejection of the line, and of the geometrical and kinematic parameters of the rocket on its dynamic stability is examined. The motion of the vehicle is described by nonlinear differential equations in a system of coordinates rigidly coupled to the rocket. A linearized mathematical model of the system is obtained. The solution of the linearized differential equation is reduced to the calculation of the eigenfunctions and the corresponding eigenvectors.

A79-32934 # Propulsion system considerations for the subsonic V/STOL J D Cyrus, M DeVillier, Jr , and J Kaminski (U S

Naval Material Command, Naval Air Development Center, Warminster, Pa) (American Society of Mechanical Engineers, Gas Turbine Conference, London, England, Apr 9-13, 1978, Paper 78-GT-57) ASME, Transactions, Journal of Engineering for Power, vol 101, Apr 1979, p 228-232 9 refs

A representative subsonic V/STOL aircraft operating on a single mission has been used as a baseline to investigate the impact of various propulsion system tradeoffs. After establishing a cycle for the propulsion system and estimating V/STOL related installation penalties, parametric engine-aircraft-mission studies have been conducted. These studies have established takeoff gross weight benefits of up to 13 percent that may be obtained by appropriate selection of the core engine sizing location. Studies of two, three and four engine versions of the configuration have shown that three engine and four engine aircraft may have 20 percent lower weight than a two engine version, but this arises at the cost of significantly reduced hot section life. (Author)

A79-32935 # Measurement of heat-transfer rate to a gas turbine stator M G Dunn and F J Stoddard (Calspan Corp , Buffalo, N Y) (American Society of Mechanical Engineers, Gas Turbine Conference, London, England, Apr 9-13, 1978, Paper 78-GT-119) ASME, Transactions, Journal of Engineering for Power, vol 101, Apr 1979, p 275-280 20 refs Contract No F33615-76-C 2092

An experimental program has been undertaken to apply advanced shock-tube technology and well established transient test techniques to the measurement of heat transfer rates on a stationary inlet nozzle of a gas turbine engine. The spatial distribution of the heat transfer rate is determined under gas dynamic conditions simulating engine operating conditions. The accuracy of the heat transfer rate determinations is ensured by the clean, uniform and well known gas dynamic condition at the turbine inlet. The experimental apparatus may also furnish useful cascade loss data

JMB

A79-32936 # Experimental study on diffusers for mixed-flow machines T Sakai (Tokyo Science University, Tokyo, Japan), T Nakayama (Hitachi, Ltd, Hitachi, Japan), and M Sanbe (American Society of Mechanical Engineers, Gas Turbine Conference, London, England, Apr 9-13, 1978, Paper 78-GT 120) ASME, Transactions, Journal of Engineering for Power, vol 101, Apr 1979, p 281-289 6 refs

As a result of examining a relationship between inlet and inside flow patterns in the pure conical mixed flow diffuser, it was disclosed that a comparatively uniform flow in the diffuser would be obtained resulting in a good pressure recovery. Also to find out an optimum configuration that would enable a stable and effective flow, tests on some model diffusers were made and the following was found the skewed flow in the pure conical diffuser was rectifiable by means of fitting some guide fences on the face of the diffuser inner wall, though a little twist was observed in the main flow between the inner and outer walls, a curved diffuser gave a slight improvement on the recovered pressure over the case of the pure conical one. (Author)

A79-33024 Measuring and improving ATC capacity B Adderley (International Federation of Air Traffic Controllers Associations, Annual Conference, 17th, Copenhagen, Denmark, Apr 24-27, 1978 | The Controller, vol. 18, Mar. 1979, p. 7-10

Ways for measuring capacity and safety of an Air Traffic System are described, and the possibilities for improving traffic control procedures at low cost are explored. The evolution of Air Traffic Control systems is considered, together with an evaluation of the need for analyzing system performance. Factors that affect airspace capacity, including aircraft performance and approach procedures, are taken into account. The use of analytical and simulation modes is discussed.

A A

A79-33025 The principle and practice of 'clutch' radar operation H W Cole (Marconi Radar Systems, Ltd., Chelmsford, Middx., England) The Controller, vol. 18, Mar. 1979, p. 13-15

The so-called clutching principle, through which the radar needs of more than one airfield are served by a single radar, is discussed. A method for quantifying the benefits derived from the principle is presented where the minimum expected value of the clutch factor results from the individual radars being close together. The operation of the principle in practice is illustrated with an example, and it is shown that the necessary performance required can be provided by current equipments.

A79-33201 Gust spectrum fatigue crack propagation in candidate skin materials R J H Wanhill (Nationaal Lucht- en Ruimtevaartlaboratorium, Emmeloord, Netherlands) Fatigue of Engineering Materials and Structures, vol. 1, no. 1, 1979, p. 5-19. 15 rafe.

Flight simulation fatigue crack propagation tests were carried out on 2024-T3, 7475 T761 and mill annealed Ti-6Al 4V sheet in thicknesses up to 3 mm and representative for transport aircraft lower wing skin stiffened panels of end load capacities 1 5 and 3 MN/m. The performance of 2024 T3 was much superior, owing mainly to greater retardation of crack growth after severe flights. The effect of load truncation was also greater for 2024-T3. The significance of the results for the choice of advanced structural concepts and materials and the choice of truncation level is discussed. A recommendation for further investigation is given

(Author)

A79-33456 Computer-aided design - Aerodynamics A B Haines (Aircraft Research Association, Ltd , Bedford, Beds , England) Aeronautical Journal, vol 83, Mar 1979, p 81-91 29 refs

The use of computers and advanced theoretical methods in aerodynamic design is reviewed Methods for calculating the supercritical flow over a two-dimensional airfoil are considered, with attention to variants of the Garabedian/Korn approach (1971) Design models of three-dimensional swept wing body combinations are taken into account, as are methods for multi-aerofoils, transonic methods for the flow over solid and ducted bodies, and second-order supersonic methods. It is noted that new mathematical techniques which would radically reduce the computing times on a given machine are being investigated.

A79-33457 Advanced application of the MADGE approach aid offshore R W G Clarke (M E L Equipment Co , Ltd , Crawley, Sussex, England) Aeronautical Journal, vol 83, Mar 1979, p 92-95

The application of the MADGE (Microwave Aircraft Digital Guidance Equipment) landing system to the Beryl 'A' platform in the North Sea, where multiple approach paths, offset in both azimuth and elevation are to be provided, is reviewed Offshore platform approach requirements are taken into account, and it is noted that at least four approach paths would be needed to mitigate the effects of the North Sea winds. The operational procedures of the system are described, as is the program to certify MADGE for approach limits offshore of 150 ft minimum descent altitude and 300 m RVR equivalent to full civil aviation passenger carrying safety standards.

A79-33458 New technology S61N simulator N D Hatfield (Redifon Simulation, Ltd., Crawley, Sussex, England) Aero nautical Journal, vol. 83, Mar. 1979, p. 96 100

A simulator for the Sikorsky S61N has been installed at Dyce Airport, Aberdeen, England, to facilitate training of pilots to fly aircraft used for oil rig work in the North Sea. The basic aspects of the training procedure are described, including preflight, departure, ILS approach, and emergencies on approach and letdown. The simulator is discussed in detail, with emphasis on design features,

control feel and AFCS systems, and the Redifon SP1 night/dusk system. The simulated ground stations are considered, noting that station information is stored on a data base.

A79-33459 A research study into the reliability of various fuel, hydraulic and air conditioning components of military aircraft G W Bleasdale (British Aerospace, Warton Div, Preston, Lancs, England) Aeronautical Journal, vol 83, Mar 1979, p 101-105 Research supported by the Ministry of Defence (Procurement Executive)

Results of a research study on aircraft mechanical system components' defects are discussed. Defects in fuel tank float switches are considered, noting that they can be grouped into seven broad categories, including quality control, high electrical load, rough handling, and contamination by fuel. Defects relating to the operation of the fuel transfer pump, fuel valve actuator, hydraulic pump, pressure regulating valve, and cold air unit are also considered. It is shown that 2% of the defects were due to external environmental conditions, such as altitude, rain, or corrosion, and 33% due to internal operating conditions, including vibration, voltage, and fatigue.

A A

A79-33460 Study of installed environment of various equipments in military aircraft. G Jones (British Aerospace, Brough, England) Aeronautical Journal, vol 83, Mar 1979, p 106 109 Research supported by the Ministry of Defence (Procurement Executive)

A mechanical systems component reliability study is used to discuss the effects of external environment- and internal operating-factors on the functional condition of an aircraft system or component Vibration levels, ambient temperature, fluid flow, corrosion, and contamination are taken into account. Few defects were found to be due to external environment factors. The internal operating factors, however, were shown to give rise to a significant proportion of the problems encountered.

A79-33461 Some observations on the local instability of orthotropic structural sections. D J Lee (Nuclear Power Co , Ltd , Risley, Lancs , England) *Aeronautical Journal*, vol 83, Mar 1979, p 110-114

Wittrick has shown (1973) that it is possible to generate the buckling coefficient curve for a plate with clamped loaded edges and any side-conditions from the buckling coefficient curve for a plate with the same side-conditions but simply supported loaded edges The paper investigates this method in the context of its application to the local buckling of structural sections. Particular emphasis is placed on the local instability of orthotropic channel sections, and a finite element analysis for this section is presented for comparison. It is shown that an accurate estimate of the buckling coefficient for a column with simply supported or clamped end conditions can be obtained from the quantities K-min (where K-min is the minimum plate buckling coefficient for simply supported column) and psi-min (where psi-min is the adjusted plate side ratio for simply supported column corresponding to K-min for m, the number of half waves of buckled column in longitudinal direction, equal to unity) for a given material and section. The parameter psi-min for a given cross section. was found to be constant for all orthotropic materials AA

A79-33586 Ultrasonic bonding arrives - 75% cost savings seen J Devine and R G Vollmer (U.S. Army, Aviation Research and Development Command, St. Louis, Mo.) *ManTech Journal*, vol. 3, no. 1, 1978, p. 11-14

Current and projected applications of ultrasonic bonding are described. Demonstration tests on access doors for advanced attack helicopters are considered, noting that the results have consistently demonstrated energy savings per spot bond up to 90%. Applications in the areas of extrusion, pultrusion, and machining, as well as on prototype doors for the 8-1 avionics bay are also considered Expected applications in electronics industry are mentioned. A A

A79-33587 Composites tooling speeds fabrication - Energy, labor cost cut sharply B M Halpin, Jr (U S Army, Materials and Mechanics Research Center, Watertown, Mass) and G A Gorline (U S Army, Aviation Research and Development Command, St Louis, Mo) ManTech Journal, vol 3, no 1, 1978, p 15-17

The hot layup-tooling technique providing significant cost reduction in the fabrication of helicopter components is discussed. The operational characteristics of the process are described, as are experiments evaluating advantages over oven curing. A summary of cost savings attributable to the technique is presented, and future plans calling for development of a single step cure are mentioned.

ΔΔ

A79-33588 Copter windshields made tougher - Special coating extends life, adds safety J R Plumer (U S Army, Materials and Mechanics Research Center, Watertown, Mass) *ManTech Journal*, vol 3, no 1, 1978, p 18-20

A U S Army research study leading to the development of a coated polycarbonate windshield design which eliminates such problems as transparency loss and spalling is discussed. The design is compared with standard acrylic windshields, noting that it has demonstrated a service life about four times greater than its counterparts. Initial tests conducted at Army's Materials and Mechanics. Research. Center are considered. A table indicating evaluation results on the performance of polycarbonates, hard coatings, acrylics, and glass cladding materials is presented.

A79-33589 NC equipment spurs blisk manufacture - Full-scale production slated F H Reed (U.S. Army, Aviation Research and Development Command, St. Louis, Mo.) *ManTech Journal*, vol. 3, no. 1, 1978, p. 24-27

A newly developed automated process for the manufacture of blisks and impellers for helicopter engine compressors is discussed Studies conducted in the 60s to define a new transport helicopter with advanced airframe and engine design are taken into account. The program for developing a multiaxis multispindle numerical control milling technique for producing blisk and impeller airfoils is described, together with a review of the airfoil forming operation. The future status of the technique is noted.

A79-33590 Erosion resistant clad rotor blades - Boride coatings do the job G A Gorline (U S Army Aviation Research and Development Command, St Louis, Mo) and A R Stetson (Solar Turbines International, San Diego, Calif) ManTech Journal, vol 3, no 1, 1978, p 28-32

Erosion of rotor blade leading edges has been found to be a major problem when helicopters operate in heavy rains or in continually dusty and sandy conditions. Recently developed coating methods expected to eliminate the problem are discussed. Results of tests with boride coatings on 410 stainless steel and 17 4PH alloys are examined, showing that the process improved the base alloy dust erosion resistance by 20 times. A recent test comparing coated alloys with the currently used chromium plate is described, as are investigations on the influence of strain in the coating on the dust erosion resistance. Technologies needed to utilize the advantages of boride coatings are mentioned.

A79-33591 Fewer controls, easier inspection - Diffusion bonding shows cost advantages J J Lucas and M J Bonassar (United Technologies Corp., Sikorsky Aircraft Div., Stratford, Conn.) ManTech Journal, vol. 3, no. 1, 1978, p. 35-39

Diffusion bonding to be used as an alternate process for fabricating Ti 6AI-4V main rotor blade spars for the UH 60A Black Hawk helicopter is discussed. The advantages of the technique over piasma-arc welding are described, showing that it does not require inert atmosphere and numerous process controls, and the diffusion bonded joints are easier to inspect than the countered and irregularly shaped weld beads. The operational characteristics of the technique

are considered, as are configuration and function of the preform shape used in process development. Process parameters and the selection of design tools are noted.

A A

A79-33600 # Economical processing for the fabrication of CFRP components (Wirtschaftliche Fertigungsmethode für den Bau von CFK-Strukturbauteilen) D Benz, K Hutterer, and S Roth (Dornier GmbH, Friedrichshafen, West Germany) Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über wirtschaftliche Herstelltechniken, Cologne, West Germany, Mar 28, 1979, Paper 79-009 52 p In German

The economical aspect of the current processing concept for CFRP components is examined by comparing cost data for wing flaps and horizontal tail assemblies using CFRP reinforcements with those using metal reinforcements in the case of wing flaps the cost factor for the fiber version was found to be 14 higher than for the metal version. With regard to horizontal tail assemblies, the estimated costs for the fiber version were shown to be between 1 27 and 1 55 higher.

A A

A79-33605 Conflict alert for the air traffic control system G Rowland (FAA, Washington, D.C.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 30-33

The conflict alert function warns controllers when aircraft are on converging courses which may lead to a violation of safe separation distances. The ATC system is briefly described with emphasis on operational/environmental differences between the 20 Air Route Traffic Control Centers and the 63 Automated Radar Terminal Systems. Conflict alert functions are described in terms of design and aircraft eligibility requirements.

A79-33606 Beacon-based collision avoidance system - Experimental results T E Morgan, Jr and B R Billmann (Computer Sciences Corp., Atlantic City, N J.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 34-38 8 refs

The paper provides an example of the use of the National Aviation Facilities Experimental Center's (NAFEC) Air Traffic Control Simulation Facility (ATCSF) This real-time simulation laboratory was used in experimental work in support of the Beacon-Based Collision Avoidance System (BCAS), one of several aircraft separation assurance programs being evaluated by the FAA Important results of the experimentation include the development of a pilot collision avoidance command response model, the identification of collision resolution logic errors, the reshaping of the threat region to reduce the rate of unnecessary alarms, and the determination that BCAS logic provides adequate pairwise conflict resolution in a terminal area

A79-33607 Factors in evaluating the effectiveness of a collision avoidance logic D L Roberts (Mitre Corp , Metrek Div , McLean, Va) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif , October 8 12, 1978, Proceedings Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p 39-42

A technique for the computer simulation analysis of a collision avoidance systems (CAS) is described. A Monte Carlo simulation program is described in terms of the simulated flight environment (including error models of various system parameters) and its interface with the CAS logic to be evaluated. This technique is applied to 14 actual midair collisions which were recreated from NTSB accident investigation reports.

A79-33608 Threat logic for air-derived CAS B Hulland (Hulland Engineering, Melville, N Y) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park,

Calif, Survival and Flight Equipment Association, 1979, p. 43-46

The threat logic concept for the BCAS (Beacon Collision Avoidance System) under development is described. The BCAS threat logic is designed to resolve conflicts in a high density air traffic environment without creating secondary conflicts. A major design goal was to produce a logic that would build pilot confidence when in visual conditions by selecting maneuvers that correspond as nearly as possible to what the pilot would select. Another major goal was to minimize any conflict of BCAS with the ATC system. The paper describes the logical structure and algorithms employed in the BCAS threat logic. As background for the discussion of the threat logic, a brief description of the overall BCAS system is included. (Author)

A79-33609 Aircrew experiences in USAF ejections, 1971-1977 W D Harrison (USAF, Inspection and Safety Center, Norton AFB, Calif), In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8 12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 47-51

Since October 1949, over 4,400 USAF aircrews have abandoned their aircraft using an explosive ejection system. The types of ejection cover a small variety of systems, such as ballistic, rocket, and encapsulated seats, and aircraft modules. Unfortunately, regardless of the improvements in ejection hardware, our success rate has not improved appreciably. During the 7 years that this report covers, the Air Force has experienced a success rate of 82 percent, matching our 28-year historical mean. In successful ejections, injuries have also remained at a high level, with 22 percent being major and 37 percent being of a lesser degree. A parachuting aircrew can be forced to land anywhere, but usually is faced with three basic possibilities an open-field parachute landing fall, a drop into the trees, or a water landing. In earlier years, survivors encountered many hazardous circumstances, spending many hours, and even days, awaiting pickup Now, 97 percent of ejectees are rescued within 4 hours, and 58 percent are picked up within the first 60 minutes following ejection (Author)

A79-33610 Mechanism of extremity injuries occurring during ejection from F-4 aircraft. S P Combs (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8 12, 1978, Proceedings

Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p 52-55

A retrospective study of F-4 ejections for 1967-1977 revealed extremity injuries during the ejection sequence in 43 of 399 ejections for an injury rate of 10 8%. The majority of severe upper extremity injuries involved the proximal joints and the majority of the severe lower extremity injuries involved the distal joints. When the windblast/windflail injuries were compared to the various variables, correlation was seen with the knots indicated airspeed (KIAS), aircraft attitude, and aircraft type.

A79-33611 Aviation emergency procedures J X Stefanki (Air Line Pilots Association, Washington, D.C.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p 56-60

Aircraft and airport emergency requirements are discussed from the point of view of the airline pilot, with emphasis placed on emergency evacuation procedures. It is concluded that aircraft and airport personnel and surrounding communities need annual compulsory simulated airport emergency training exercises for airport certification in order to upgrade their ability to handle any medical mass emergency situation.

A79-33612 CFR Vehicle design and performance objectives. R Mitchell (Walter Motor Truck Co., Voorheesville, N.Y.) In Survival and Flight Equipment Association, Annual Symposium,

16th, San Diego, Calif, October 8-12, 1978, Proceedings
Canoga Park, Calif, Survival and Flight Equipment
Association, 1979, p. 61-67

Tables of design and performance requirements for CFR (crash fire rescue) vehicles are presented. These vehicles must be capable of delivering fire fighting agent and personnel to the scene of an accident within the practical limits of a given airport, this would require quick response over improved and unimproved terrain, making the vehicle's off-road ability and acceleration critical Particular consideration is given to the design and performance of a quick response or rapid intervention vehicle which would be necessary for fighting a holding action pending the arrival of major fire fighting vehicles.

A79-33613 An overview of the U.S. Navy Maximum Performance Ejection System J. J. Tyburski (U.S. Naval Material Command, Naval Air Development Center, Warminster, Pa.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

. Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p. 71-74.

The Maximum Performance Ejection System (MPES) program was initiated in 1969 in order to address various problems associated with escape systems in high performance and V/STOL type aircraft. The present paper is an overview of the various state-of the-art technology advances employed by MPES in order to attain superior escape performance during adverse altitude and inverted conditions at altitudes as low as 50 feet. Consideration is given to basic seat structure, restraint, recovery, propulsion and control, and survival subsystems.

B J

A79-33614 Feasibility demonstration of a vertical seeking seat steering system W J Stone (U S Naval Weapons Center, China Lake, Calif) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif , October 8 12, 1978, Proceedings Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p 75-78

The design, fabrication, and testing of a steering and autopilot system for an aircrew escape seat are described. The seat steering system consists of a two-axis gimbaled spherical rocket motor, hydraulic actuators, servovalves, and hydraulic power supply. The autopilot uses a three-axis strapdown rate gyro sensor package and microprocessor. Three seat flight tests demonstrating the capability of the system to steer the escape seat into a vertical-seeking trajectory from adverse aircraft attitude ejections are described. B J

A79-33615 Vertical-seeking autopilot design R G Stoutmeyer (US Naval Weapons Center, China Lake, Calif) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p 79-82

The concept of a vertical seeking, thrust vector controlled ejection seat requires sophisticated yet inexpensive electronic control hardware (an autopilot) to guide the seat to an upright posture irrespective of initial attitude. A simplified strap-down inertial sensing system configured around the 8080 A Industrial Standard Microprocessor was chosen. This mating of aerospace guidance technology and the semiconductor industry's large-scale integration digital processor technology resulted in a highly successful, low-cost seat controller/sequencer with software flexibility. A review of the electronic hardware and software algorithms, with salient features of each, is presented.

A79-33616 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes G R Drew (U S Navy, National Parachute Test Range, El Centro, Calif) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif , October 8-12, 1978, Proceedings Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p 83-86

A79-33617 Aerodynamic effects simulator F E Gerber and W J Hock, III (Dayton T Brown, Inc., Bohemia, N Y) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 87-90

An aerodynamic simulator which would complement sled and flight testing of aircraft escape systems is proposed. The simulator design makes use of an existing windblast facility, and includes an airflow generator capable of producing an airstream velocity up to 600 knots, as well as instrumentation to record ejection seat velocity and acceleration and canopy separation and trajectory. Problems in attaining a uniform airflow from the six by ten ft generator nozzle are discussed.

A79-33618 Development and initial test results of parachutes with Automatic Inflation Modulation /A I M / D 8 Webb (Irvin Industries Canada, Ltd., Fort Erie, Ontario, Canada) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8 12, 1978, Proceedings

Canoga Park, Calif , Survival and Flight Equipment Association, 1979, p. 106-112

The Automatic Inflation Modulation program for the development of improvements in the control of emergency escape personnel parachute opening in order to produce the fastest possible opening consistent with human tolerances is presented. Improvements consist of the use of unidirectional stretch fabrics in the crown of the parachute to provide the canopy with a variable permeability governed by the dynamic pressure applied, thus allowing opening time to depend directly on the deployment speed, with an extension of the deployment speed envelope. The use of a small auxiliary parachute within the main canopy (Webb chute) is intended to provide forced symmetrical and consistent canopy opening. Current development work is concerned with investigating the performance limits of the proposed concepts and the development of a new canopy design. It is concluded that the proposed improvements are capable of alterations to parachute opening timing and loading in the manner required to improve parachute recovery distance ALW

A79-33619 Basis for an objective evaluation of the paratroop jumping reliability J Rousseau (Aerazur, S.A., Issy-les-Moulineaux, Hauts-de-Seine, France). In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8.12, 1978, Proceedings. Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 113-116.

The paper describes a parachute evaluation procedure in which a range of jump parameters is specified which characterize a successful jump. An analytical model for predicting jump reliability is proposed, taking into account at least 23 random variables.

PTH

A79-33620 Milestones in the history of parachute development D Gold (Irvin Industries, Inc., Stanford, Conn.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979. p. 117-122

The first successful pack-on-body parachute was developed at the beginning of the 20th century, but it was not until the era of the Second World War that a number of technical advances based on aerodynamic principles were introduced into parachute design Ribbon parachutes and extremely stable solid (guide-surface type) parachutes were produced at this time. The advent of aircraft capable of speeds in the Mach 1 0 3 0 range led to the use of conical ribbon parachutes with built-in multi porosity geometries. Extended skirt parachutes and pressure packing techniques also receive attention.

J M B

A79-33622 Ejection systems in the year 2000 A B McDonald (Douglas Aircraft Co., Long Beach, Calif.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979. p 130-134

This paper describes aircrew ejection systems which will be available in the year 2000. The scope of system development which can be expected is defined by reference to the rate of innovation that has occurred in the last 20 years. Factors which govern development are discussed and areas where future improvements would be desirable are described. Future trends in aircraft development are projected to identify possible new ejection system requirements. Ejection system technology is discussed with regard to the potential developments that would permit significant advances in the state of the art. On the basis of the projected requirements and expected technology advances, potential design innovations are described. These include developments in inflatable structures, microelectronics, and ballistic subsystems that could result in significant improvements in capability relative to current systems.

A79-33623 US Navy developments in crashworthy seating L P Domzalski, M E Katzeff, and J T Micciche (US Naval Material Command, Naval Air Development Center, Warminster, Pa In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 135-143, 24 refs

The Naval Air Development Center has conducted various RDT&E programs in the areas of crashworthy armored/unarmored pilot/copilot seats, energy attenuation, advanced restraint system, and crashworthy troop, gunner, and military passenger seats. The present paper reviews some of the significant crashworthy fixed-seating programs conducted by the Navy Consideration is given to the energy attenuator programs, the CH-46E crashworthy crewman seat, the joint Army/Navy standardized crewman seat, the crashworthy unarmored crewman seat, and the crashworthy gunner/crew chief seat.

A79-33624 Inflatable survival systems for helicopters E J Colacicco (U.S. Naval Material Command, Naval Air Development Center, Warminster, Pa.) and M. Sloane (Sanders and Thomas, Inc., Pottstown, Pa.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 144-149

A review of the accounts concerning water ditchings of helicopter aircraft indicates that a number of lives may potentially be saved by the introduction of one of several new supplementary inflatable systems. Since a number of victims had insufficient time to egress from their downed aircraft prior to its rapid inversion and sinking, one corrective approach discussed involves the use of a helicopter flotation-stability system for preventing inversion and sinking. Another program development presented is one whereby personnel life rafts are stowed external to the aircraft and are automatically expelled upon contact with water. This system would replace the current inboard stowage of rafts and would aid that survivor who succeeds in escaping the aircraft but who does not have sufficient time to avail himself of liferaft flotation as now provided (Author).

A79-33626 * Helicopter emergency escape L J Bernent (NASA, Langley Research Center, Hampton, Va) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p 155-164

The three-man Rotor Systems Research Aircraft (RSRA) Emergency Escape System, the first system known to be fully qualified and operational in a rotary wing aircraft, will have two modes of operation one providing for full in flight egress, and the other for the severance of the rotor blades for a return to base as a fixed-wing aircraft. This paper describes the escape system's design principles, integration into the aircraft, qualification, and performance.

(Author)

A79-33630 Detection of CAT and low altitude wind shear by on-board aircraft IR sensors - An update P M Kuhn (NOAA, Atmospheric Physics and Chemistry Laboratory, Boulder, Colo) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 181-184

In-flight testing on NASA jet aircraft has been carried out for a NOAA infrared system designed to provide clear air turbulence and low-altitude wind shear alerts. Clear air turbulence encounters were forecast 80% of the time on board the C-141-A, and 86% of the time on board the NASA Learjet. False alarm rates were 10% and 25%, respectively.

A79-33635 Development and testing of a dual mode escape propulsion system D M Sorges (U S Naval Weapons Center, China Lake, Calif) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 250-253

This paper describes the development and feasibility testing of a Dual Mode Escape Propulsion System (DMEPS) applicable to ejection seats utilizing a pneumatically-actuated underseat motor DMEPS is specifically designed to expand the safe ejection envelope for inverted or near inverted ejections DMEPS consists of two major subsystems - an electronic unit which monitors aircraft attitude, and an interrupter system mounted on the ejection seat which selectively prevents ignition of the underseat motor based on data supplied by the electronic unit (Author)

A79-33636 Unique crew escape concepts for ATS mission aircraft. D E Swanson and V K Rajpaul (Boeing Aerospace Co, Seattle, Wash) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8 12, 1978, Proceedings Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p 254-257

An investigation into the critical environments and problems associated with escape from a high performance aircraft led to some of the new ideas for crew escape from these aircraft. These were screened and combined resulting in five concepts for comparison within a tradeoff study. The concepts were then configured as basic functional elements in a crew escape system within the framework of a combat aircraft with ATS (air-to-surface) mission. A tradeoff study compared each scheme in terms of escape capability (Mach 3, 80,000 ft altitude, 2000 psf dynamic pressure, 6-10 g), airframe integration, cost, weight, reliability, maintainability, development risk and impact on rescue and survival operations. Three schemes show potential for providing escape in the specified environment. These are the separable forebody, the optional ejection direction, and the retained windshield/aftbody streamline configurations. (Author)

A79-33637 An experimental passive microwave attitude measurement system for escape system steering. J O Hooper and B Heylauff (U.S. Naval Weapons Center, China Lake, Calif.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 258-261

Previous design studies including closed loop digital simulation have led to a baseline design for a microwave radiometric (MICRAD) attitude reference system (MARS) for pilot escape systems steering An experimental MICRAD attitude reference measurement system (MARMS) has been designed, fabricated, and tested A data collection mission in an operational environment has been carried out (June 14, 1978) aboard a thrust vector-controlled vertically seeking pilot escape system The MARMS atop the rocket powered escape system was fired toward the nadir from an altitude of 100 feet. The MARMS performed throughout the vertically seeking trajectory, however, much of the MICRAD signal data was biased outside of the dynamic range of the telemetry channels. Planned data

collection on the ground in a control environment and operational flight data will be used to further test system concepts and lead to the design of experimental MARS for a free flight guidance demonstration (Author)

A79-33639 High strength stitching for aircraft personnel restraint systems L Farris (Pacific Scientific Co., Anaheim, Calif.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8-12, 1978, Proceedings

 $$\tilde{C}_{anoga}$$ Park, Calif , Survival and Flight Equipment Association, 1979, p. 273-275

A79-33640 Death by misadventure W L Traynor (Stencel Aero Engineering Corp., Asheville, N.C.) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif., October 8.12, 1978, Proceedings Canoga Park, Calif., Survival and Flight Equipment Association, 1979, p. 276-281, 6 refs.

Studies sponsored by US military services have shown that 40 to 60% of the fatalities due to helicopter crashes could be prevented by in-flight escape systems. In this paper a reliable, cost-effective in-flight escape system which can be adapted to several types of helicopters is described. Problems related to blade and canopy severance also receive attention. In addition, the inadequacy of autorotation for preventing helicopter accidents is mentioned. J.M.B.

A79-33644 Anatomy of an aircraft accident R E Engel In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8-12, 1978, Proceedings

Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 303, 304

A Continental Airlines DC-10 taking off from Los Angeles International Airport blew out two tires, causing the pilot to abort the takeoff. As the aircraft went off the runway, the left main gear collapsed, rupturing two fuel tanks. The spilled fuel ignited at once Prompt arrival of a fire-fighting team and a high application (more than 3000 gal per min) of extinguishing agents led to rapid control of the fire. As a result of fire-fighting efficiency and good emergency procedures at the site, only three of the 197 people on board the aircraft lost their lives.

A79-33646 On the status of experimental stress analysis of parachute canopies H G Heinrich (Minnesota, University, Minneapolis, Minn) In Survival and Flight Equipment Association, Annual Symposium, 16th, San Diego, Calif, October 8 12, 1978, Canoga Park, Calif, Survival and Flight Equipment Association, 1979, p. 315-321. 19 refs. Research supported by the University of Minnesota, Contracts. No F33615-68-C-1227, No. F33615-73-R-3149, No. F33615-C-0020

A sensor for measuring stress in parachute canopies and other flexible structures was developed. Its sensing elements are a curved metal beam and electric strain gages. To avoid transfer of bending moments from nonrigid surfaces to the sensor, the ends of the curved beam are glued to the structure by means of cloth tabs. Because of its shape the sensor is called omega sensor. Under the open side of the beam the cloth is slotted and the stress in the surface is transfered across the slot by the sensor. Therefore, the omega sensor measures the stress independent of the strain of the material.

(Author)

A79-33827 Very Large Vehicle Conference, Arlington, Va, April 26, 27, 1979, Technical Papers Conference sponsored by the American Institute of Aeronautics and Astronautics, New York, American Institute of Aeronautics and Astronautics, Inc., 1979–133 p. \$10,000

Papers are presented on the demand for large freighter aircraft as projected by NASA cargo/logistics airlift system studies, large wing-in-ground effect transport aircraft, and nuclear aircraft innovations and applications Consideration is also given to large lighter-

than-air vehicles, the concept of a large multimission amphibian aircraft, and strategic airlift vehicle concepts

A79-33828 # Analyzing technology potential for strategic airlift S L Brown (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio) and G A Pasquet (USAF, Military Aircraft Command, Scott AFB, III) In Very Large Vehicle Conference, Arlington, Va, April 26, 27, 1979, Technical Papers

New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 1.7. 7 refs. (AIAA 79-0841)

In the time required to develop and demonstrate a technology, an operational scenario may change, with a possible change in flight vehicle requirements. To resolve this dilemma, the AFFDL is sponsoring exploratory programs to analyze the relation between technology performance and military effectiveness. A current laboratory goal is identification of technologies that enhance the airlift mission while being relatively insensitive to scenario changes. In these analyses the aircraft is considered as one element in a total dynamic mobility system. To understand aircraft technology contributions, the variables of time, productivity, airfield characteristics, and military effectiveness are considered. (Author)

A79-33829 * # Demand for large freighter aircraft as projected by the NASA cargo/logistics airlift systems studies A H Whitehead, Jr (NASA, Langley Research Center, Aeronautical Systems Div , Hampton, Va) and W H Kuhlman (McDonnell Douglas Corp , Long Beach, Calif) In Very Large Vehicle Conference, Arlington, Va , April 26, 27, 1979, Technical Papers

New York, American Institute of Aeronautics and Astronautics, inc., 1979, p. 8-18. 7 refs. (AIAA 79 0842)

This paper examines the market conditions up through the year 2008 to provide a preliminary assessment of the potential for and the characteristics of an advanced, all-cargo transport aircraft. Any new freighter must compete with current wide-body aircraft and their derivatives. Aircraft larger than the wide-bodies may incur economic penalties and operational problems. A lower direct operating cost is not a sufficient criterion to base a decision for the initiation of a new aircraft development or to select aircraft characteristics. Other factors of equal importance that are reviewed in this paper include considerations of the system infrastructure, the economics of the airlines, and the aircraft manufacturer return on investment. The results of the market forecast and a computer simulation show that an advanced long range aircraft with a payload between 68 to 181 tonnes (75 to 200 tons) could generate a solid foothold beginning around 1994.

A79-33830 # Large wing-in-ground effect transport aircraft R H Lange and J W Moore (Lockheed Georgia Co., Marietta, Ga.) In Very Large Vehicle Conference, Arlington, Va., April 26, 27, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 19-29. 16 refs. (AIAA 79-0845)

The paper presents results of preliminary design studies of large wing-in-ground (WIG) effect transports utilizing a power-augmented ram (PAR) system for lift enhancement. These studies include span-loader and fuselage-loader designs and cover gross weights up to 1.9 million lbs and payloads up to 661,500 lbs. It is found that the PAR/WIG transport aircraft shows relatively low operating empty and gross weights and only slightly lower cruise fuel efficiency than a high subsonic speed land-based conventional advanced technology transport.

A79-33831 * # Large lighter-than-air vehicles N J Mayer (NASA, Washington, D C) In Very Large Vehicle Conference, Arlington, Va , April 26, 27, 1979, Technical Papers

New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 45-52. 13 refs. (AIAA 79-0847)

The background of experience and the results achieved in building large airships are discussed. Two current applications are identified. These are in heavy vertical lift and in long endurance patrol. The most promising concepts for these missions include hybrid combinations of helicopters and aerostats and more conventional rigid types. These new approaches will require some technology development in aerodynamics and structures, but all vehicles will benefit from application of modern methods and materials.

(Author)

A79-33832 * # Concept for a large multi-mission amphibian aircraft J C Vaughan, III (NASA, Langley Research Center, Hampton, Va) and T D Earl (Bell Aerospace Textron, Buffalo, N Y) In Very Large Vehicle Conference, Arlington, Va, April 26, 27, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 53-61. 8 refs. (AIAA 79-0849)

A very large aircraft has been proposed for meeting both civil cargo and military transport needs for 1995 and beyond. The concept includes a wide noncircular fuselage cross section with a low wing, thick inner wing section, fuselage-mounted engines, and an air cushion landing gear. The civil freighter operates independently of congested passenger airports, using sheltered water as a runway and a waterfront land site for parking and ground operations. The military transport can operate from a wide variety of surfaces and temporary bases. The air cushion landing gear weighs substantially less than conventional gear and permits the use of extended takeoff distance resulting in improved payload/gross weight ratio.

A79-33833 # Strategic airlift vehicle concepts F C Newton (McDonnell Douglas Corp , Long Beach, Calif) In Very Large Vehicle Conference, Arlington, Va , April 26, 27, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc , 1979, p 62 66 (AIAA 79 0850)

A study is reported whose object was the definition of future strategic airlift vehicle concept options and the technologies required for successful operational implementation for the year 2000 and beyond. The definitions include vehicle characteristics, operational features, and figures of merit reflecting the relative effectiveness and cost implications of the options. The primary conclusion is that the distributed-load configuration concept offers an attractive technology option for the strategic airlift mission. Not only does this concept exhibit the lowest life cycle cost and acquisition cost, but also the best vehicle size is relatively insensitive to the scenario assumptions.

B J

A79-33834 * # Technology requirements and readiness fo. very large vehicles D W Conner (NASA, Langley Research Center, Systems Analysis Branch, Hampton, Va) In Very Large Vehicle Conference, Arlington, Va, April 26, 27, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 67-75 (AIAA 79-0851)

Common concerns of very large vehicles (VLV) in the areas of economics, transportation system interfaces, and operational problems are reviewed with respect to the influence of these factors on aircraft configurations and technology. Fifty four technology requirements for VLVs have been identified and rated with regard to technology readiness. The requirements were about equally divided among the four general areas of aero/hydrodynamics, propulsion and acoustics, structures, and vehicle systems and operations. None of the requirements were considered to have an excellent technology readiness.

B.J.

A79-33835 # Advanced nuclear systems for large aircraft J P Layton In Very Large Vehicle Conference, Arlington, Va, April 26, 27, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p 76-130 19 refs (AIAA 79-0852)

Recent advances in nuclear power and propulsion systems as well as aircraft technology have resulted in large military aircraft concepts that promise practical operational aircraft. An approach to the interdependent definition of future military missions and credible nuclear aircraft based on a carefully conceived program of analysis, research, and technology is outlined. Particular consideration is given to advanced nuclear aircraft concepts, including heavier-

than-air and lighter than-air. Aspects of operational safety are emphasized. B J

A79-34305 A new high product rate 10 nanosecond, 256 point correlator K H Norsworthy (Boeing Aerospace Co , Seattle, Wash) *Physica Scripta*, vol 19, Apr 1979, p 369-378 6 refs

The design philosophy and performance characteristics of a new high product-rate correlator developed for weapon systems applications and fluid mechanics research are described. The design approach provides versatility for time sharing 30 1-bit multipliers between 256 correlation processing channels with the full speed of the multipliers (12.5 MHz) being utilized irrespective of the magnitude of the delay increment selected. The correlator can either accept digitized pulsed signals (LDV applications) or continuous analog voltages and can be set to operate in either a double-clipped, double-linear, or single linear mode of operation. Microprocessor-controlled output circuitry provides a convenient display format and the capability for Fourier transformation of the computer correlation function.

A79-34314 Preliminary studies using photon correlation velocimetry in turbomachinery and combustion systems R S Adrain, R C Klewe, D G Wright (Central Electricity Generating Board, Marchwood Engineering Laboratories, Southampton, England), R L Elder (Cranfield Institute of Technology, Cranfield, Beds, England), P H Richards, and G D Smith (Cambridge University, Cambridge, England) *Physica Scripta*, vol 19, Apr 1979, p 441-446 6 refs

This paper combines three presentations to the conference on 'Photon Correlation Techniques in Fluid Mechanics' It describes preliminary results of velocity and turbulence measurements from experiments designed to tackle the constraints imposed by large scale engineering devices. Two of the papers deal with turbomachinery and the third with a small combustion system. Measurements in an axial compressor are described which compare the performance of a two-spot laser system with that of an angled hot wire and concentrates on the development of the wake region as the flow moves downstream. Also a Doppler fringe system is used to obtain velocity profiles in the diffuser section of a centrifugal impeller. The data presented was obtained mainly at an operational speed of 30,000 rpm but some results are given for a speed of 60,000 rpm Different problems are encountered with combustion systems and these are discussed with reference to measurements on small industrial burner

A79-34392 Experimental analysis of V H F antennas for helicopter homing systems using scale-model techniques M S Smith (Royal Aircraft Establishment, Farnborough, Hants, England) Radio and Electronic Engineer, vol 49, Apr 1979, p 197-203 5 refs

A typical requirement in azimuthal antenna systems operating in frequency bands between 30 and 400 MHz is to enable the pilot to home on to a ground transmission. The use of scale modeling for assessment of helicopter homing systems, including appropriate measurements techniques for 800-1050 MHz and 180-450 MHz frequency bands, is described. Three different homing applications, left-right homing at 135-175 MHz, left-right homing at 30-75 MHz, and fore-aft homing at 135-175 MHz, are examined, demonstrating the importance of the antennas' interaction with the aircraft's metal fuselage.

The article presents a brief profile of the British firm Triplex describing the selection of the firm as suppliers of windshields for the Boeing 767 and 747 aircraft. Aircraft for which the Triplex became suppliers and contracts the firm did not succeed in receiving are also mentioned, in context with the sharpening of its technical and marketing efforts. The construction and features of the 747 windshield are detailed. The argument of flat versus curved glass is discussed and requirements for airworthness and spin offs in other markets such as locomotive windows are mentioned.

A79-34504 # Semiautomatic control of aircraft Systems of manual aircraft control (Poluavtomaticheskoe upravlenie samoletom Sistemy ruchnogo upravlenia samoletom) V I Rudis Moscow, Izdateľstvo Mashinostroenie, 1978 151 p 6 refs. In Russian

The book is concerned with problems of manual flight control in all regimes, with particular reference to optimization of the man-machine interface. Specifications of aircraft characteristics for manual control are indicated. Attention is given to the relations between the aircraft design flexibility and the pass band of corrective automatic devices. Methods of designing automatic devices for improving manual aircraft control are discussed.

A79-34521 * # Identification of a STOL propulsion plant model from flight data R L De Hoff (Systems Control, Inc. /VT/, Palo Alto, Calif.) Journal of Guidance and Control, vol. 2, May-June 1979, p 235 240 10 refs. NASA Contract No. 36074-13

Accurate dynamic models for propulsion system behavior are critical to successful synthesis of STOL autothrottle/autoland control systems. This paper describes the development of a nonlinear dynamic model for the response of a STOL aircraft in the landing/approach configuration. The model is based upon an analysis of the throttle, governor, and turbofan engine components. Model parameters are directly identified from data acquired during a flight of the NASA Augmentor Wing Jet STOL research aircraft. The accuracy of the model and a comparison of results for two engines are described. Various approaches to modeling propulsion system response for complex systems representative of current and near-term aircraft are discussed. (Author)

A79.34522 # The role of the backside parameter in height control K Kato (Tokyo, University, Tokyo, Japan), S Mihara, and H Nakamura Journal of Guidance and Control, vol 2, May-June 1979 p. 241.246 10 refs

Height control in continuous gust fields is formulated as a stochastic regulator problem and the relation between mean square (ms) height error and the backside parameter is examined. The following results are shown. First, when the throttle loop is open, elevator alone ceases to be a reasonable control strategy when the backside parameter is negative. The minimum achievable ms height error is essentially only a function of the backside parameter, ms error is zero when the backside parameter is positive, while it is inversely proportional to the absolute value of the backside parameter when it is negative. For the landing approach, this holds true approximately, regardless of airplane type Second, when the throttle loop is closed, it is generally difficult to tightly control velocity and height simultaneously in conventional airplanes. This is mainly because the thrust change available in control is quite limited, particularly in deceleration. To realize tight control in height, the accuracy in velocity control must be relaxed and the backside parameter has to be properly large

A79-34531 # Time-variant aerodynamics of oscillating airfoil surfaces in a supersonic flowfield S Fleeter and R E Riffel (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, Ind.) AIAA Journal, vol. 17, May 1979, p. 465-470, 8 refs

The results of an experimental study of the time-variant aerodynamics associated with harmonically oscillating single airfoil surfaces in a supersonic flowfield are presented. Six single airfoil configurations were investigated a flat plate, wedge, flat plate-convex corner, wedge-convex corner, MCA suction surface, and MCA pressure surface. The basic time-variant aerodynamic data obtained for each of these configurations included the chordwise distribution of the unsteady pressure magnitude (expressed as an unsteady pressure coefficient) and its phase lag as referenced to the airfoil motion, with Mach number as parameter. All of the data obtained are correlated with a low reduced frequency prediction which includes the effects of airfoil camber and thickness distribution.

(Author)

A79-34534 # Unsteady pressure measurements on rotor blade tips with incidence H Triebstein (Deutsche Forschungs- und Versuchsanstalt für Luft und Raumfahrt, Institut für Aeroelastik,

Gottingen, West Germany) AIAA Journal, vol 17, May 1979, p 514 518

Measurements of pressure distributions on a harmonically oscillating rotor blade wing in low subsonic speed are reported. The measurements were carried out in the 3×3 m subsonic wind tunnel of the DFVLR in Gottingen. Pressures were measured at five sections of the wing in such a way that the three-dimensionality of the pressure distribution could be well observed. The flow speed was 45 m/sec. The oscillation frequencies were 2, 4, and 6 Hz, with reduced frequencies of 0.07, 0.14, and 0.21. The oscillation amplitudes ranged from 8=1.3 deg, and the angles of attack were 0, $\overline{3}$, $\overline{6}$, $\overline{9}$, and 12 deg. Comparisons with theoretical and experimental results were made. The analytic predictions were found to agree well with the measured data. At the wing tip, however, the agreement was not uniform. A brief description of the test facilities is also presented.

(Author)

A79-34537 * # Peak Strouhal frequency of subsonic jet noise as a function of Reynolds number K Yamamoto (New York, State University, Buffalo, N Y) and R E A Arndt (Minnesota, University, Minneapolis, Minn) AIAA Journal, vol 17, May 1979, p 529 531 9 refs USAF supported research, Grant No NGR-39 009-270

The narrowband spectral characteristics of the acoustic field generated by subsonic jets at low Reynolds numbers were studied in terms of a dimensionless power spectral density. It was found that the variation of the sound magnitude of the spectrum is an increasing function of the Reynolds number. The maximum level of the spectrum is not a linear function of the Reynolds number. The spectra are insensitive to Reynolds number above a critical value of about 100,000. Up to Reynolds number of this magnitude, the peak Strouhal frequency observed at 30 deg emission angle is identical with that at 90 deg for any exit Mach number. At higher Reynolds number the peak Strouhal number increases with increasing emission angle. The peak Strouhal number was found to be about 0.2, which is nagreement with previous findings that a few discrete modes at a Strouhal number of around 0.2 in low Reynolds number supersonic jets are powerful noise generators.

A79-34539 * # Asymmetry of a circular jet observed in near and far fields K Yamamoto (New York, State University, Buffalo, N Y) and R E A Arndt (Minnesota, University, Minneapolis, Minn) AIAA Journal, vol 17, May 1979, p 533-535 NASA USAF-supported research

Turbulence intensity measurements were made in three different-size jets at various Mach numbers and the aerodynamic jet axis, defined as the locus of points in the flow at which the turbulence intensity is minimum, was determined. The deviations from the geometrical jet axis were on the order of 2.4% of the nozzle diameter, and the pure jet axis had the form of a helical wave. A similar asymmetry in the radiated noise was also noted. The measured circumferential distribution of rms fluctuating velocity signals confirmed the asymmetry of even a circular jet.

A79-34550 Formation of sooty particles in combustion chambers with series injection of air into the combustion zone A G Tumanovskii (Vsesoiuznyi Teplotekhnicheskii Institut, Moscow, USSR) (Teploenergetika, vol. 25, no. 9, 1978, p. 40-42.) Thermal Engineering, vol. 25, no. 9, 1978, p. 26-28. Translation

The health standards strictly limit the amount of smoke (soot) emission from gas turbine plants operating on liquid fuels. For precise estimation of smoke formation in a combustion chamber, tests are performed using the procedure of collecting solid particles on special filtering surfaces by passing through them a calibrated sample of combustion products. The sampling train consists of a tube for sampling, a unit with a filtering element, a flowmeter to measure gas flow through the filtering surface, and a thermometer. The tests confirm that one of the efficient methods of reducing the concentration of sooty particles to an acceptable health standard fevel in high-heat-release-rate combustion chambers burning liquid fevels is the use of air-operated atomizers.

A79-34580 Traffic background level and signal duration effects on aircraft noise judgment. G. W. Johnston and A. A. Haasz (Toronto, University, Downsview, Ontario, Canada) *Journal of Sound and Vibration*, vol. 63, Apr. 22, 1979, p. 543-560, 13 refs Research supported by the Ministry of Transport

The effects of background traffic noise level and signal duration on perceived aircraft noise levels during a flyover event are investigated Tapes of traffic noise at different levels on which aircraft flyover noise events of different durations were super imposed were played to groups of observers in a room simulating indoor conditions. It is found that the presence of steady background traffic noise reduces the perceived noisiness of aircraft flyovers provided that the duration of the flyover event is sufficiently short in relation to flyover time. For a given event level, a reduction of 21 dB(A) in background noise level leads to the perception of a 5.5 dB(A) increase in peak event level. Regressions of observer response with the noise pollution index show a lower correlation than those with variables based on background noise level and peak signal level, although the data are found to exhibit a number of significant trends associated with noise pollution index variations

A79-34585 Relation between static and in-flight directivities of jet noise A Michalke (Berlin, Technische Universität, Berlin, West Germany) and U Michel (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung Turbulenzforschung, Berlin, West Germany) Journal of Sound and Vibration, vol 63, Apr 22, 1979, p 602-605

The effects of flight on the directivity of jet noise are predicted without recourse to a turbulence model. The acoustic effect of flight is calculated by solving the convective Lighthill equation including jet temperature effects. Theoretical results are compared with measurements of static and in-flight directivity on a line parallel to the jet path. The predictions are shown to be in good agreement with the measurements, especially for emission angles of 90 deg to the jet axis, where existing theories fail. It is noted that the formula derived provides only a lower limit to intensities in flight, due to disturbances in the nacelle boundary layer, which are not taken into account.

A79-34595 # In-flight captive store loads compared with wind-tunnel and mathematical simulations A R Maddox (U S Naval Weapons Center, China Lake, Calif), R E Dix, and G R Mattasits (ARO, Inc., Arnold Air Force Station, Tenn.) Journal of Aircraft, vol. 16, May 1979, p. 289-295, 8 refs

A series of flight tests were made to acquire captive loads data on a store to compare with corresponding data from several wind-tunnel tests, as well as with the best mathematical models when conditions were matched as closely as possible. The store consisted of an Mk83 bomb shape mounted on a triple-ejector rack (TER) on an F-4 aircraft which was instrumented complete with a standard research boom mounted on the nose. The flight conditions spanned Mach 0 6-0 9 in both maneuvering and steady flight. Corresponding wind tunnel tests were made at 5% and 10% at specific research centers The data show good correlation between flight test and wind tunnel for moderate subsonic Mach numbers when good geometric similarity is maintained, but there is a pronounced divergence in this agreement as the Mach number is increased. Correlation between mathematical models of this problem and the flight test show the same magnitude in loads and moments, but the trends do not always agree. This is most pronounced in the pitch plane

A79-34596 # Lifting surface approach to the estimation of gust response of finite wings H Okubo (Osaka Prefecture, University, Sakai, Japan), M Kobayakawa, and H Maeda (Kyoto University, Kyoto, Japan) Journal of Aircraft, vol. 16, May 1979, p. 309-314, 13 refs.

Unsteady response of finite wings flying though turbulence is investigated using linearized lifting surface theory. The NLR method, extended to the unsteady case, is employed for the numerical calculation of the lift force arising from oscillatory gusts for a wide range of frequencies. An efficient numerical procedure is presented for the estimation of the response to random turbulence. It takes into consideration the instantaneous variation of the vertical velocity of turbulence along the span as well as the spanwise distribution of the aerodynamic influence function. This procedure uses the relation between the output power spectral density and the spanwise cross spectrum of turbulence, defined in terms of the spanwise correlated frequency response function, which in turn is derived from the aerodynamic transfer matrix for the modified upwash field The results computed by means of this method with a model of turbulence uniform in span, and with a model of isotropic turbulence, exhibit considerable differences. Moreover the calculated lift spectrum is influenced by the spanwise load distribution which varies in shape according to the wing planform and the frequency of austs (Author)

A79-34597 # A computational scheme for structural influence coefficients of certain planar wings J E Moore, Jr (USAF, Armament Laboratory, Eglin AFB, Fla) and M A Cutchins (Auburn University, Auburn, Ala) *Journal of Aircraft*, vol 16, May 1979, p. 315-319 10 refs

The objective of this work has been to reduce the amount of numerical computation work involved in obtaining structural influence coefficients, especially for special purpose computer programs involving wings that have elastic axes that can be approximated by a series of straight line noncollinear segments. The need for repetitive runs, probably due to different mass arrangements, enhances the desirability of the technique. A general matrix of influence coefficients which allows the user to handle the N segmented case is derived and presented. The decreased number of integral evaluations is summarized for a three segmented case as an illustration - only 12 integrals compared to 27 (straight), only 12 integrals compared to 42 (noncollinear) For collinear segments of practical wings, the order of required integral evaluations is shown to differ by N squared and by more for noncollinear cases. Therefore, a significant reduction in computation effort is claimed (Author)

A79-34600 F101 engine derivative work advances W C Wetmore Aviation Week and Space Technology, vol 110, May 14, 1979, p 57, 59, 61

The F101-X fighter engine having a thrust-to-weight ratio of 7 5 1, to be flight tested in 1981, is discussed. The structural design is considered, showing that the compressor disks are welded together to form a drum rotor, with fan pressure ratio being in excess of three and maximum airflow at about 270 lb/sec. The ultraviolet sensor used as a light-off detector to inhibit high fuel flow rates is noted, as are the hydraulic actuators and the outer flaps and seals located in the exhaust nozzle. The uncooled and tip-shrouded stages in the low pressure turbine ignition procedures, and the core fuel control are mentioned.

A79-34604 Response of plate to nonstationary random load G Ahmadi and M A Satter (Pahlavi University, Shiraz, Iran) Acoustical Society of America, Journal, vol 65, Apr 1979, p 926-930 23 refs Research supported by the Ministry of Science and Higher Education and Atomic Energy Organization of Iran

The response of a rectangular plate subjected to nonstationary random load is studied. The general expressions for the autocorrelation and the mean square displacement are derived and discussed. Similar study was carried out for the stress components. The random excitation is then assumed to be a modulated white noise or narrow-band process. It is shown that when the damping coefficient is small, simple approximate expressions can be obtained for the variances of the lateral displacement as well as the stress components. Several examples using a simply supported plate are presented.

(Author)

A79-34608 The measurement of RF-pulse phase and amplitude in the landing system DLS (Die Messung von Phase und Amplitude an HF-Impulsen im Landesystem DLS) E Vachenauer (Siemens AG, Munich, West Germany) Frequenz, vol 32, Apr 1979, p 113-117 In German Research supported by the Bundesministerium für Forschung und Technologie

A method for determining aircraft flight direction, applied in the Landing System DLS is described. Two ground stations, located at the runway, receive the RF-pulses from a landing aircraft with special antenna systems consisting of many individual antennas, and determine azimuth and elevation by measuring and evaluating the phase and amplitude distribution at the individual antennas. The latter are connected to receivers with switchable amplifiers to allow the measurement of RF-pulse phase and amplitude over a dynamic range of 80 dB. The measuring results are fed to a computer to determine the direction. (Author)

A79-34650 # Characteristics of Laval nozzles with gasdynamic regulation (Kharakteristiki sopel Lavalia s gazodinamicheskim regulirovaniem) | S Varganov (Kievskoe Vysshee Voennoe Aviatsionnoe Inzhenernoe Uchilishche, Kiev, Ukrainian SSR) Prikladnaia Mekhanika, vol. 15, Apr. 1979, p. 97-99. In Russian

Experimental data are presented on the thrust characteristics of Laval nozzles with gasdynamic regulation. Particular consideration is given to the influence of nozzle underexpansion or overexpansion on the thrust coefficient.

A79-34691 On some methods for the numerical simulation of flows with complex structure N N lanenko, V M Kovenia, V D Liseikin, V M Fomin, and E V Vorozhtsov (Akademiia Nauk SSSR, Institut Teoreticheskoi i Prikladnoi Mekhaniki, Novosibirsk, USSR) (Deutsche Forschungsgemeinschaft, International Conference on Finite Elements in Nonlinear Mechanics, Stuttgart, West Germany, Aug 30-Sept 1, 1978) Computer Methods in Applied Mechanics and Engineering, vol 17 18, Mar 1979, p 659-671 18 refs

The paper considers the development of efficient difference schemes for application to compressible viscous heat conducting gas flows. Particular consideration is given to the problem of shock wave localization in the numerical simulation of such flows. The methods presented are essentially efficient in the computation of flows of complex structure, where singular zones and elements are present (e.g., shock waves and transitions, contact strips, boundary layers, double and triple shock configurations, etc.)

A79-34761 * # Global services systems Space communication F H Shepphird and H L Wolbers (McDonnell Douglas Astronautics Co , Huntington Beach, Calif) In Conference on Advanced Technology for Future Space Systems, Hampton, Va , May 8 10, 1979, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc , 1979, p 519 525 10 refs Contract No NAS1 12346 NASA Task 28 (AIAA 79 0946)

The requirements projected to the year 2000 for space-based global service systems, including both personal communications and innovative services, are developed based on listoric trends and anticipated worldwide demographic and economic growth patterns. The growing demands appear to be best satisfied by developing larger, more sophisticated space systems in order to reduce the size, complexity, and expense of ground terminals. The availability of low cost ground terminals will, in turn, further stimulate the generation of new services and new customers.

A79-34823 Britain's better airbus wing D Velupiliai Flight International, vol. 115, May 5, 1979, p. 1471, 1472

British Aerospace which produces the wings for the A 300 has been chosen to design and produce the wings for the new, shorter A 310 Competitive performance through significant aerodynamic and structural improvements is forecast, with such features of the wing as double curvature, outboard wing skin joints, and a two spar wing box

detailed The double curvature design requires shot blasting which allowed placing of the span wise skin joints further outboard Because of the A 310's slightly smaller wing the center span has been deleted allowing uninterrupted main ribs between the front and rear spars, eliminating additional joints and the need for two access covers. Fuel wetted areas of the wing box will employ interference fit bolts. Also under consideration is electrical signalling for the airbrakes and spoiler. Carbon fiber reinforced plastic may be used for the airbrakes and leading edge shrouds instead of fiberglass.

A79-34824 Weapons for the black-box war D Richard son Flight International, vol 115, May 5, 1979, p 1476 1480, 1485-1488, 1493-1495

Techniques used to degrade and confuse radar defenses, allowing bombers and strike aircraft to avoid or blunt fighter or missile attacks are outlined NATO Band designations are presented and three broad categories of equipment are investigated, these being receivers, jammers and decoys. Under receivers, IFF and RWR systems are covered. Various levels of complexity are surveyed, the Thomson CSF-BK, Marconi ARI 18228, U.S. systems such as the APR 25RWR, APR 26 LWR and ALR 66. The Soviet Sirena series RWR is also highlighted as are anti-radar 'wild weasel' aircraft. The section devoted to jammers discusses concepts such as spot noise, swept spot noise jamming, barrage jamming, range gate pull off, velocity and track breaking, inverse amplitude modulation and inverse gain jamming. Chaff and its dispersal methods are covered in the Decoy section.

A79-34921 Quieter short and medium haul aircraft R E Pendley (Douglas Aircraft Co., Long Beach, Calif.) Airport Forum, vol. 9, Apr. 1979, p. 19, 20, 22 24. In English and German

The article details efforts by the aircraft industry to reduce aircraft noise levels. Noise sources such as fan inlet, fan exhaust, turbine, jet core and airframe are discussed, showing how by pinpointing the different noise sources, it becomes easier to reduce each in turn, thereby effecting an overall noise reduction. Diagrams illustrating graphically the relationship between engine noise and surrounding area are included. The latest engine technology, which will be applied to the DC 9 Super 80 and includes large diameter fans and an internal mixer, is discussed. Noise reduction can in turn mean a subsequent reduction in airport operating expense, such as the need to purchase less surrounding real estate for a buffer zone.

A79-34922 Four jets for short haul work BAe 146 J Lupson (British Aerospace Aircraft Group, Hatfield, Herts, En gland) Airport Forum, vol 9, Apr 1979, p 39, 40, 42, 43 In English and German

The article discusses the features of the BAe 146, a four engined short-haul aircraft, claimed to be quieter than today's twin engine models. The aircraft has been designed to operate equally well from minimally developed fields as well as big international airports. One of the important features is outstanding performance from 'hot and high' airfields. The take-off field length of less than 1,500 m and good visibility are important at small airfields in difficult terrain. A turning diameter of only 18.03 m, low sill heights, large passenger and access doors allow quick ground handling and servicing. The aircraft also features an APU and GPU power points and pressure and gravity fueling points. Ease of access, simplification of systems and handling, result in quick, 20 minutes turn-around.

A79-34923 Preventing fires in airport fuel systems L Scheichl *Airport Forum*, vol 9, Apr 1979, p 49, 50, 54 (3 ff) In English and German

This article examines the storage of aviation fuels in respect to fire prevention, discussing their physical properties and behavior in storage tanks. Flash points, ignition temperatures, burning limits, etc are presented. Discussion also includes protecting tank farms from fire and the various types. fixed roof, fixed roof with floating ceiling, and floating roof tanks are dealt with. Accomodating escaping vapors with vents and relief valves and precautions necessary when filling or draining tanks are also covered.

A79-34925 # Measurement of ozone in an aircraft S van Heusden (Philips' Gloeilampenfabrieken, Philips Research Laboratories, Eindhoven, Netherlands) and L G J Mans (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands) Philips Technical Review, vol 38, no 45, 1978 1979, p. 131 134

Ozone levels were monitored outside and in the cabins of a jet aircraft making a scheduled flight between Europe and North America. The measurements showed that 60 to 70% of the ozone present in the atmosphere was admitted to the cabins, as expected, the ozone level depended closely on aircraft altitude with respect to the tropopause. It was found that ozone concentrations in the cabins exceeded the IATA limits of 80 to 100 ppb during most of the flight. The medical effects of chronic exposure to elevated ozone concentrations are discussed.

A79-34971 Perspectives on airport environmental compatibility, Proceedings of the Economic/Environmental Specialty Conference, Miami, Fla , March 2, 3, 1978 Conference sponsored by the Airport Operators Council International Washington, D.C., Airport Operators Council International, 1978 243 p. S20

The costs of airport noise control, the adoption of compatible land-use planning for airport vicinities, the consultant's role in developing airport noise control programs, and means of assessing airport noise are discussed. Topics of the papers include the Environmental Noise Act adopted by Maryland, the integrated noise model proposed by the FAA for airport planning and land use control, the preventive airport noise control program developed by the Salt Lake City International Airport, and the recovery of expenses incurred in airport noise abatement.

A79-34972 # Airport noise control and land use compatibility study P B Gaines (Salt Lake City Airport Authority, Salt Lake City, Utah) In Perspectives on airport environmental compatibility, Proceedings of the Economic/Environmental Specialty Conference, Miami, Fla , March 2, 3, 1978 Washington, D.C., Airport Operators Council International, 1978, p. 27-44

Noise control and land use compatibility are not currently problems for the Salt Lake City International Airport, but planning has been initiated to guarantee that municipal or airport expansion does not lead to such problems in the future Preferential runway use, displaced runway thresholds, preferential approach and depar ture tracks, and specification of engine run up areas are among the means under consideration to control noise levels. Zoning, building codes, easements, and taxing policies can be used by the municipalities to prevent incompatible land use.

J M B

A79-34973 # A comparison of costs associated with local actions to reduce aircraft noise impacts R H Doyle and J C Orman (Peat, Marwick, Mitchell and Co, San Francisco, Calif) In Perspectives on airport environmental compatibility, Proceedings of the Economic/Environmental Specialty Conference, Miami, Fla, March 2, 3, 1978 Washington, D C, Airport Operators Council International, 1978, p 45 101

Corrective and preventive measures to control airport noise are described, and the responsibility of the airport authority, the airlines, and the FAA in carrying out noise abatement actions is discussed Operational changes to control airport noise include extension of an existing runway, adoption of a computer program to modify noise exposure, alteration of aircraft maintenance procedures, imposition of curfews on aircraft operations, and establishment of greenbelt buffer areas around airports. The acquisition of restricted-use easements and avigation easements, as well as the insulation of certain publicly owned buildings can contribute to airport noise reduction. Master plans for airports and their environs, and the installation of noise monitoring systems are also mentioned.

A79-34974 # Off-airport land use compatibility - The Maryland approach and experience T J Truby (State Aviation Administration, Baltimore, Md.) In Perspectives on airport environmental compatibility, Proceedings of the Economic/Environmental Specialty Conference, Miami, Fla., March. 2, 3, 1978
Washington, D.C., Airport Operators Council International, 1978, p. 127-141

The Environmental Noise Act adopted by Maryland in 1974 provides for the minimization of the airport noise to which existing development is subjected, and prevents the introduction of new noise-sensitive development in the vicinity of airports. The law mandates a noise control program for each of the public-use airports licensed by the state. Local jurisdictions adopt airport noise regulations governing airports that are not state-owned, these regulations must be at least as stringent as the state code. The limits established for cumulative noise exposure for various land-use categories are presented.

A79-34975 # FAA proposes that the standard noise model be the integrated noise model /INM/ J Reynolds (FAA, Office of Airports Programs, Washington, D.C.) In Perspectives on airport environmental compatibility, Proceedings of the Economic/Environmental Specialty Conference, Miami, Fla , March 2, 3, 1978 Washington, D.C., Airport Operators Council International, 1978, p. 219-234

The latest version of the FAA integrated noise model (INM), released in 1978, is applicable to airport planning and land-use control. The INM data base contains flight profiles and noise characteristics for most commercial airliners and a few general aviation aircraft Preparation of noise data for a medium hub airport with an average of 500 operations per day (50% jet aircraft) indicates that the model can furnish very economical contour studies and 1000-ft grid analyses. The INM should prove useful in drawing up environmental impact statements for airport development plans.

JME

A79-34978 # Suppression of radio-electrical disturbances of electrostatic origin on aircraft (Elimination des perturbations radio-electriques d'origine electrostatique sur avions) J L Boulay (ONERA, Châtillon sous-Bagneux, Hauts de-Seine, France) La Recherche Aerospatiale, Mar Apr 1979, p 89 108 24 refs In French Research supported by the Direction des Recherches, Etudes et Techniques

The paper reviews the main effects of accumulation of electrostatic charge on aircraft, presents some models for corona discharge and the antenna discharge coupling phenomenon, and examines some of the principal methods of suppressing radio electrical disturbances. The mathematical demonstration by Tanner (1853) of coupling between an electric discharge and an antenna is reviewed and interpreted, and experimental methods of determining two key functions which appear in the analysis are presented. The characteristics of orthogonal-decoupling dischargers and dischargers with multiple and independent discharges are studied, and types of antistatic protection of dielectric surfaces are defined.

A79-34980 # Light propeller aircraft noise (Bruit des avions légers a heilie) C Dahan, L Avezard, G Guillien, C Malarmey, and J Chombard (ONERA, Châtillon sous Bagneux, Hauts-de-Seine, France) La Recherche Aerospatiale, Mar Apr 1979, p 129 137 9 refs In French

The acoustic field of a Rallye 235 aircraft was investigated by the microphone technique in conjunction with a model for predicting propeller noise. The microphone measurements were complemented by flyover noise measurements by a technique which made it possible to avoid difficulties associated with the Doppler effect. The calculation model was modified to take into account ground reflection, but although the model predicted well for the fly-away phase, the measured levels are higher than predicted for the approach phase. It is concluded that further analysis should take into consideration 'thickness' noise and noise due to unsteady loading

PTH

A79-34996 * , Tests of NASA ceramic thermal barrier coating for gas turbine engines C H Liebert (NASA, Lewis Research Center, Cleveland, Ohio) American Vacuum Society and American Society for Metals, International Conference on Metallurgical Coatings, San Diego, Calif, Apr. 23-27, 1979, Paper. 8 p. 5 refs

A NASA ceramic thermal barrier coating (TBC) system was tested by industrial and governmental organizations for a variety of aeronautical marine, and ground based gas turbine engine applications. This TBC is a two layer system with a bond coating of nickel-chromium aluminum-yttrium (Ni 16Cr-6A1 0 6Y, in wt %) and a ceramic coating of yttria stabilized zirconia (Zi 02-12Y203, in wt %). Tests (Liebert and Stenka, 1979) have been conducted to determine corrosion resistance, thermal protection, durability, thermal conductivity, and fatigue characteristics. The information presented covers some of the significant test results obtained on the first three items. The information also includes photographs of coated parts after tests, measurements of coating loss, amount of metal wall temperature reduction when the TBC is used, and extent of base metal corrosion.

A79-35097 * Error analysis of a satellite interferometer navigation system G S Gopalapillai (Battelle Columbus Labora tories, Columbus, Ohio) Marine Geodesy, vol 2, no 3, 1979, p 247 267 11 refs Contract No NASw-2800 NASA Task 3

An error analysis is performed for a global positioning and navigation system which relies on an orthogonal array of interferometry baselines on board a geostationary satellite. The error analysis involves linearization of a mathematical model which is based on the relationship between the measured phase differences, the known transmitter positions, and other systematic error parameters. According to the error analysis, position accuracy is critically dependent on the baseline length and the magnitude of the random component of the measuring errors. It is shown that a satellite interferometry system with baselines of about 50 m can yield position accuracies on the order of 20 m.

A79-35100 Airline productivity redefined - An analysis of US and European carriers P S Morrell (Alistair Tucker Associates, London, England) and N K Taneja (MIT, Cambridge, Mass.)

Transportation, vol. 8, Mar. 1979, p. 37-49, 12 refs.

It is suggested that productivity in terms of net value added per man year of labor and capital input, provides a more useful yardstick of airline efficiency than the widely used indices representing average unit costs or labor productivity. European airlines productivity is lower than or equal to US airlines. These variations can be explained almost entirely by differences in level of service, demand patterns and route characteristics. A regression model is used to indicate that productivity could be increased by changes in network shape through a more liberal exchange of traffic rights, greater specialization and consumer choice - by offering higher frequency, multi-city service. In addition, the model indicates that European airlines could increase their productivity by 2.2% by lowering their charter activity to the U.S. level.

A79-35110 # Investigation of the regimes of flow past the upper surfaces of delta wings with shock waves separated from the leading edges (Issledovanie rezhimov obtekaniia verkhnei poverkhnosti V-obraznykh kryl'ev s otsoedinennym ot perednikh kromok skachkom uplotneniia) lu P Gun'ko and I I Mazhul' (Akademiia Nauk SSSR, Institut Teoreticheskoi i Prikladnoi Mekhaniki, Novosibirsk, USSR) Akademiia Nauk SSSR, Sibirskoe Otdelenie, Izvestiia, Seriia Tekhnicheskikh Nauk, Feb 1979, p 132 138 14 refs In Russian

An experimental study of flow characteristics on the upper surfaces of delta wings was conducted for the Mach number range of 1.75.4.0. Visualized surface streamlines and measured wing-span pressure distributions were used to study flow patterns for the case of shock waves detached from the leading edges. Conditions of shock separation are established for cases of weak and strong shocks normal to the leading edges. Experimental data are compared with calculated results.

B.J.

A79-35155 # Parameters of three-dimensional flow past a wing near the free surface of a ponderable fluid (Parametry prostranstvennogo potoka pri obtekanii kryla vblizi svobodnoi poverkhnosti vesomoi zhidkosti) A B Lukashevich Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza, Mar Apr 1979, p 54 62 10 refs In Russian

The three-dimensional flow past a submerged wing is studied on the basis of a singularity method wherein the effect of the free surface of the ponderable fluid is represented as the effect of an infinite layer of sources. Particular consideration is given to the relationship between wave generation behind the wing and the separation of free vortices from the wing. Downwash distribution behind the wing is investigated.

A79-35158 # Hypersonic viscous shock layer on infinitespan arrow wings at angle of attack (Giperzuukovoi viazkii udarnyi sloi na strelovidnykh kryliakh beskonechnogo razmakha, obtekaemykh pod uglom ataki) | G Brykina and E A Gershbein Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza, Mar Apr 1979, p 91 102 13 refs In Russian

The paper presents a theoretical investigation of the flow of a viscous compressible gas in a hypersonic shock layer on infinite span arrow wings with blunt leading edges at angle of attack. The hypersonic shock-layer equations are solved by the method of successive approximations, which permits an analytical solution for the first approximation as well as an exact numerical solution Formulas are presented for coefficients of friction and heat transfer on the surface of the body as well as for velocity and temperature profiles across the shock layer.

A79-35210 Multichannel infrared receiver performance S J Dunning (USAF, Data Systems Div , Sunnyvale Air Force Station, Calif) and S R Robinson (USAF, Institute of Technology, Wright-Patterson AFB, Ohio) Applied Optics, vol. 18, May 15, 1979, p. 1567-1576, 14 refs

The performance of an IR receiver designed to detect a target by taking advantage of the target's spectral signature is presented, with reference to such equipment as FLIR systems. The receiver processes the signal in several narrow frequency bands and is based on a statistical model which represents the field in each band as a Gaussian random process whose moments depend on the target and background characteristics. The optimal Bayes/Neyman-Pearson receiver structure for an M spectral channel, N sequential look receiver is presented and practical suboptimal receiver structures are developed. Numerical methods are used to calculate the probability of false alarm and the probability of detection using identical parameters for each processor.

A79-35449 The derivation of a thickness noise formula for the far-field by Isom F Farassat (Joint Institute for Advancement of Flight Sciences, Hampton, Va) Journal of Sound and Vibration, vol 64, May 8, 1979, p 159, 160 Army sponsored research

Isom (1975) derived a thickness noise formula for a hovering helicopter blade which is valid in the far field. Isom derived his result using a frame fixed to the rotating blade, thus giving the impression that it is valid for a hovering rotor or a static propeller. It is shown in the present paper that the formula is more general and is valid for any body in arbitrary motion.

A79-35475 # Technical characteristics and cost data for the II 62 and II-62M aircraft and optimal flight conditions (O niektorych charakterystykach techniczno-ekonomicznych samolotow II 62 i II 62M, z uwzglednieniem optymalnych zakresow przelotowych) K Rzemek Technika Lotnicza i Astronautyczna, vol 34, Apr 1979, p 24 26 5 refs In Polish

A79-35501 # Radio-engineering tracking systems (Radio-tekhnicheskie slediashchie sistemy) V A Puzyrev Radioelek tronika, vol 22, Mar 1979, p 3 9 17 refs In Russian

Optimal control theory is used in formulating the problem of designing a radio engineering tracking system. Algorithms are presented which make it possible to realize a fully automated design procedure. The control algorithm which is obtained includes optimal estimation and optimal control/tracking.

A79-35502 # Optimal excitation of amplitude direction-finder antennas operating on the basis of the comparison method (Optimal'noe vozbuzhdenie antenn amplitudnykh pelengatorov, rabotaiushchikh po metodu sravneniia) B M Minkovich and lu lu Makhnenko Radioelektronika, vol 22, Mar 1979, p 10 17 15 refs In Russian

An analytic expression is obtained for minimization of the error of an amplitude-direction finder antenna system. This expression, obtained in the form of a generalized integral parameter which takes into account the sidelobe power, is used to obtain explicit solutions to isoperimetric variational problems of optimal excitation of circular-aperture antennas. Consideration is given to a monopulse direction finder and a direction finder with time separation of channels which operate on the basis of the comparison method.

A79-35506 # Correlation-extremal direction finding of extended and point sources of electromagnetic oscillations (Korreliatsionno-ekstremal'noe pelengovanie protiazhennykh i tochechnykh istochnikov elektromagnitnykh kolebanii) V K Baklitskii Radioelektronika, vol 22, Mar 1979, p 41 45 6 refs In Russian

Nonlinear filtering is used to obtain an algorithm of optimal processing of signals from extended or point sources of electromagnetic radiation. This algorithm makes it possible to determine the discrimination factor of the direction finder. The study is applied to methods of amplitude-difference, phase, and holographic direction finding.

B.J.

A79-35584 # Optimization of hypersonic three-dimensional shapes (Optimizatsiia giperzvukovykh prostranstvennykh form) lu A Vedernikov, V G Dulov, and A F Latypov *PMTF - Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki*, Jan -Feb 1979, p 65 71 10 refs In Russian

In the framework of a Newtonian flow scheme with friction correction, a new class of three dimensional configurations with power law longitudinal and transverse contours is considered, which includes, in particular, a body of revolution, multicantilever wings, and curvilinear semiwedge bodies with circular middle. The values of the parameters determining the optimal streamline surface are determined by the method of random search over the best probe with the objective of minimizing the total body drag. It was found that in the aspect ratio range 0-4 the optimal hypersonic shapes are bodies with star-shaped middle.

PTH

A79-35656 Effect of friction on motion of a piston driven by combustion products V A Poselevich, N N Piliugin, and S Iu Cherniavskii (PMTF Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki, Sept Oct 1978, p 73 80) Journal of Applied Mechanics and Technical Physics, vol 19, no 5, Mar 1979, p 634 639 14 refs Translation

In recent years, the two stage light gas ballistic apparatus with deformable plastic pistons has become widely used in experimental aerodynamics. The existing methods of calculating such devices either completely neglect friction of the piston against the channel walls, or use a schematization of the frictional forces which does not have a satisfactory physical basis. In a number of studies, the friction force was considered constant and its value was specified not from physical considerations, but to produce the best agreement between calculated and experimental values of object velocity or driving gas pressure. Since friction is such a significant factor, its proper consideration in calculating piston motion parameters requires special study. In this connection, it is useful to consider the operation of only the first stage of the ballistic apparatus, which sets the piston in motion. The present analysis deals with the internal ballistics of a one-stage powder-driven apparatus in which a piston.

made of polymer material performs a friction motion. The friction model is constructed on the basis of a series of experiments on the slow forcing of polymer specimens compressed in the longitudinal direction through a steel channel. (Author)

A79-35717 Optimization of wing structures to satisfy strength and frequency requirements V R Rao, N G R Iyengar, and S S Rao (Indian Institute of Technology, Kanpur, India) Computers and Structures, vol 10, Aug 1979, p 669-674 13 refs Research sponsored by the Ministry of Defence of India

In this investigation minimum weight design of wing structures with restrictions on strength, stability and frequency characteristics is attempted. The multiweb delta wing structure is idealized with three different kinds of finite elements. The constant stress triangular plate elements, the rectangular shear panels and pin jointed bar elements are used to represent, respectively, the cover skins, webs and the stringers of wing structures. A parametric study is made to reduce the number of design variables which in turn reduces the required computational effort. The feasibility of employing linearly approximated redesigns is investigated. Numerical results are presented to illustrate the feasibility. Off design charts have been obtained by performing sensitivity analysis about the final optimum design point.

A79-35777 A finite element approach to subsonic aerodynamics W G Habashi (Concordia University, Montreal, Canada) International Journal for Numerical Methods in Engineering, vol. 14, no. 5, 1979, p. 665-679, 14 refs

A study of the application of the finite element method to compressible potential flows, typified by the airfoil problem, is undertaken. Some novel approaches, believed to simplify solution techniques, are presented. The solutions use two pseudo-variational integrals, appropriate to subsonic flows, and possessing a physical iterative basis. With constant derivatives triangular elements formulated for cylindrical coordinates, accurate solutions are easily obtained for the flow over a circular cylinder. For arbitrary airfoils a simple mapping is used to transform them into near circles. An appropriate mesh is then constructed in the mapped plane. The paper then presents two solution approaches by which this nonlinear problem is solved in both the near circle plane and the airfoil plane. (Author)

A79-35895 Solution of boundary value problems for the vibration equation for a jet engine model (Losung von Randwertproblemen der Schwingungsgleichung für ein Modell eines Triebwerkeinlaufs) N Friedrich (Saarland, Universität, Saarbrucken, West Germany) Mathematical Methods in the Applied Sciences, vol 1, no 2, 1979, p 138-157 13 refs in German

A model of a jet engine consists of two coaxial cylinders, of which the inner extends in both directions to infinity and the outer is semi-infinite. The model is valid for a compressible and inviscid gas at subsonic velocity. The induced pressure and velocity fields are sought for when (1) the speed distribution in the compressor inlet plane is given, and (2) the pressure distribution is given. The Wiener Hopf method is applied to the acoustic approximation of the basic equations. An infinite system of linear equations is obtained, involving the expansion coefficients of the solution with respect to the eigenfunctions of the concentric cylindrical duct. The relevant information is extracted by using arguments from perturbation theory.

A79 35921 A method for the optimal layout of driving mechanisms of the aileron for gliders and motorplanes (Ein Verfahren zur optimalen Auslegung von mechanischen Ruderantrieben bei Segelflugzeugen und Motorsportflugzeugen) M Hiller (Stuttgart, Universität, Stuttgart, West Germany) Zeitschrift für Flugwissenschaften und Weltraumforschung, vol 3, Mar Apr 1979, p 75-86 6 refs In German

A method is described which allows the layout of the spatial driving mechanism of the aileron for a glider or a motorplane to be

performed in a systematic manner. In particular, a prescribed input output behavior of the mechanism can be realized by variation of individual parameters of the spatial four-bar mechanisms which constitute the entire driving mechanism. At the same time the forces acting in the mechanism can be limited by imposing maximum values of the forces as secondary conditions during the variation process.

(Author)

A79-35923 A flyable suspended model helicopter for the investigation of the human pilot behaviour (Ein flugfahig eingespannter Modellhubschrauber zur Untersuchung des menschlichen Reglerverhaltens) W Oesterlin (Darmstadt, Technische Hochschule, Darmstadt, West Germany) Zeitschrift für Flugwissenschaften und Weltraumforschung, vol 3, Mar Apr 1979, p 98 108 12 refs In German

This paper describes the design and control of a servo-control mechanism with a model helicopter for the investigation of the human pilot behavior as a multi-loop control component. A simple multi-loop model for the behavior of a human pilot is presented for the hovering state. The correspondence of the model with the human pilot behavior has been confirmed by simulation. (Author)

A79-35925 An exploratory investigation of quasi-free flying models in a supersonic short-duration wind tunnel B N Pamadi (Indian Institute of Technology, Bombay, India) and G Schwarz (Stuttgart, Universitat, Stuttgart, West Germany) Zeitschrift für Flugwissenschaften und Weltraumforschung, vol 3, Mar -Apr 1979, p 116-125 14 refs

Experiments were conducted on the AGARD HB 2 calibration model in a 9 cm x 6 cm short duration supersonic wind tunnel at Ma = 3 6 where the quasi free flying model was always maintained in the test section viewing area throughout the run by a fine hylon thread (0.1 mm diam). The static and dynamic stability derivatives deduced from the time motion data agree well with the established results. An interferometric study of the flow around the model with and without string showed that the flow separation over the string influences only the flow around the leading edge of the body and leads to a small drag reduction of about 7% (Author)

A79-35926 A special extension of the General Point Performance Equation (Spezielle Erweiterung der 'Allgemeinen Flugzustandsgleichung') M Kloster (Messerschmitt-Bolkow Blohm GmbH, Munich, West Germany) Zeitschrift für Flugwissenschaften und Weltraumforschung, vol 3, Mar -Apr 1979, p 125-129 In German

The General Point Performance Equation, as introduced by Bruning and Hafer (1978), is extended using a special set up of thrust and an exponential polar dependent on Mach number. The dependence on density and Mach number is analyzed through approximation formulas such that the point of performance equation is simplified to enable the calculation of all flight regimes without difficulty. The pitch angle as function of Mach number as well as the angle of the steepest climb are calculated using data given for a high-capacity transporter.

STAR ENTRIES

N79-21996# Advisory Group for Aerospace Research and Development Paris (France)

HIGH ANGLE OF ATTACK AERODYNAMICS

Jan 1979 542 p refs in ENGLISH and FRENCH Conf held at Sandefjord Norway 4-6 Oct 1978

(AGARD-CP-247 ISBN-92-835-0230-2) Avail NTIS HC A23/MF A01

Reports were presented on (1) studies of configurations of practical application (10 papers) (2) mathematical modelling and supporting investigations (12 papers) (3) design methods (7 papers) and (4) air intakes (2 papers) Eight additional short presentations on these subjects are also documented

N79-21997# National Aeronautical Establishment Ottawa (Ontario) Unsteady Aerodynamics Lab

EFFECT OF HIGH ANGLES OF ATTACK ON DYNAMIC STABILITY PARAMETERS

K J Orlik-Rueckemann *In* AGARD High Angle of Attack Aerodyn Jan 1979 14 p refs

Avail NTIS HC A23/MF A01

Effects of flight at high angles of attack are presented for dynamic stability parameters and their significance for the analysis of aircraft motion at those flight conditions. The topics included (1) the strong nonlinear variations of many stability parameters with angle of attack (2) the emergence of new categories of parameters such as cross-coupling derivatives that are only of interest for high angle-of-attack or other asymmetrical flight conditions (3) the significance of time-dependent parameters such as represented by derivatives due to time rates of change of angles of attack and sideslip (4) the strong configuration dependence of aerodynamic characteristics as illustrated by large effects of strakes and of various shapes of aircraft forebody and (5) the need for establishing and verifying a mathematical model that would satisfactorily describe the motion of an aircraft in the presence of all these high angle-of-attack effects. J A M

N79-21998# Messerschmitt-Boelkow-Blohm G m b H Munich (West Germany)

HIGH ANGLE OF ATTACK CHARACTERISTICS OF DIFFERENT FIGHTER CONFIGURATIONS

H John and W Kraus In AGARD High Angle of Attack Aerodyn Jan 1979 15 p refs

Avail NTIS HC A23/MF A01

Increased maneuverability at the lower end of the flight envelope offers new and attractive possibilities for fighter aircraft. To extend the flight regime at low speeds up to high angles of attack beyond maximum lift requires the ability to trim and control the aircraft and by this avoid departure and spin susceptibility at those conditions. Basic aerodynamic characteristics of different fighter configurations at separated flow beyond maximum lift are reviewed where the resultant derivatives are completely different from those associated with attached flow. The change in trim conditions is primarily dependant on wing planform and overall aircraft configuration. Results are shown about the aerodynamic development of aircraft configuration which meet these requirements and at the same time minimize the resulting drag penalties in the conventional angle of attack regime J.A.M.

N79-21999# Royal Aircraft Establishment Farnborough (England)

SOME UK RESEARCH STUDIES OF THE USE OF WING-BODY STRAKES ON COMBAT AIRCRAFT CONFIGURA-TIONS AT HIGH ANGLES OF ATTACK G F Moss In AGARD High Angle of Attack Aerodyn Jan 1979 19 p refs

Avail NTIS HC A23/MF A01

Experimental research of interest to design engineers incorporating strakes in combat-aircraft configurations is considered. It is likely to be many years before a satisfactory mathematical model is achieved for the detailed flow about such configurations and there is thus an urgent need to explore the various aerodynamic features of these devices experimentally both to obtain satisfactory solutions to current problems and to guide theoretical work which will form the basis of future design methods.

N79-22000*# General Dynamics/Fort Worth Tex
DESIGN GUIDELINES FOR THE APPLICATION OF FOREBODY AND NOSE STRAKES TO A FIGHTER AIRCRAFT
BASED ON F-16 WIND TUNNEL TESTING EXPERIMENT

C W Smith and C A Anderson In AGARD High Angle of Attack Aerodyn Jan 1979 11 p refs

(Contract NAS1-15006)

Avail NTIS HC A23/MF A01 CSCL 01C

During the YF-16 and F-16 developmental wind tunnel test program numerous variations in nose and forebody strakes were investigated. These data were reviewed, and the strake aerodynamic characteristics coalesced into design guidelines for the application of strakes to fighter aircraft. The design guides take the form of general equations governing the modification of forebody strakes to obtain a linear pitching moment curve and the calculation of the resulting lift and drag increments Additionally qualitative comments are made concerning the effects of strake geometry on lateral/directional stability. It is concluded that the generation of incremental strake lift is primarily dependent upon the area affected by the strake-induced vortex and that strake planform is of secondary importance. Forebody strakes have small beneficial effects on lateral/directional stability if properly designed however significant gains are easily attained with nose strakes

N79-22001# Northrop Corp Hawthorne Calif Aerodynamics Research Dept

FOREBODY/WING VORTEX INTERACTIONS AND THEIR INFLUENCE ON DEPARTURE AND SPIN RESISTANCE

A M Skow A Titiriga Jr and W A Moore In AGARD High Angle of Attack Aerodyn Jan 1979 26 p refs

Avail NTIS HC A23/MF A01

In-depth studies were conducted to determine the effects of these shed vortices and to isolate parameters which strongly influence them Arising from these studies methodologies were developed which can be used as general guidelines in the design of both aircraft forebody shapes and hybrid-wing planform shapes such that the interactions between these vortex systems will enhance aircraft stability.

N79-22002# Royal Aircraft Establishment Farnborough (England)

STRAKE-INDUCED SEPARATION FROM THE LEADING EDGES OF WINGS OF MODERATE SWEEP

S P Fiddes and J H B Smith In AGARD High Angle of Attack Aerodyn Jan 1979 12 p refs

Avail NTIS HC A23/MF A01

Mechanisms were proposed to account for the observation that on a wing of moderate sweep and aspect ratio leading edge separation occured at a lower incidence when strakes (i.e. highly swept forward extensions to the wing root) were attached ahead of it. The effect on the main wing of the vortices resulting from the leading edge separation on the strake was considered and a simplified approach to modelling the flow over strake-wing combinations was introduced.

N79-22003# Messerschmitt-Boelkow-Blohm G m b H Munich (West Germany)

AERODYNAMIC CHARACTERISTICS OF A FIGHTER-TYPE CONFIGURATION DURING AND BEYOND STALL

W Staudacher B Laschka P Poisson-Quinton (ONERA Paris France) and J P Ledy (ONERA Paris France) *In* AGARD High Angle of Attack Aerodyn Jan 1979 15 p refs

Avail NTIS HC A23/MF A01

Low speed wind tunnel tests were conducted with a MBB pilot model Angle of attack regime investigated comprised alpha = 0 divided by 90 deg Emphasis was directed towards the stability and/or control contributions of configurational items such as strakes canards tails, rudders and controls and maneuver flap systems as well as the technique of concentrated spanwise blowing Isolated and combined effects of those devices and systems are demonstrated and some unconventional control devices are introduced

N79-22004# Lockheed-Georgia Co Marietta Flight Sciences

THE APPLICATION OF SPANWISE BLOWING FOR HIGH ANGLE OF ATTACK SPIN RECOVERY

J J Cornish III and M W M Jenkins In AGARD High Angle of Attack Aerodyn Jan 1979 12 p

Avail NTIS HC A23/MF A01

A unique autorotation tunnel test was performed on a 1/30th scaled model of an F-4 fighter configuration. During this test air was blown spanwise over the wing from various nozzle locations and the influence of this blowing on the spinning mode was recorded Over 50 test conditions were evaluated for both flat (alpha = 45 degrees) and steep (alpha = 80 degrees) spin modes. The wing blowing was very effective in arresting the spin for the steep spin mode and not very effective in stopping the flat spin. Nose blowing was also evaluated with only marginal success. An optimum wing nozzle location and blowing level was identified. These data, when scaled to full-scale values showed that the required nozzle diameter was 1 92 inches located close to the wing root 1/4 chord point and 18 lb/sec of air was required to affect recovery. More efficient and effective recovery is possible in the tunnel with an additional degree of freedom and with empennage blowing. Further, larger scale testing is urged

N79-22005# Societe Nationale Industrielle Aerospatiale Toulouse (France)

BEHAVIOR OF A TRANSPORT AIRCRAFT WITH A HIGH ASPECT RATIO WING AT A HIGH ANGLE OF INCIDENCE [COMPORTEMENT A HAUTE INCIDENCE U'UN AVION DE TRANSPORT A AILE A GRAND ELANCEMENT]

D Collard In AGARD High Angle of Attack Aerodyn Jar 1979 12 p In FRENCH

Avail NTIS HC A23/MF A01

Results of wind tunnel test on a model of a Concorde supersonic transport aircraft with a high aspect ration wing at a high angle of incidence are reported Graphs and especially flow visualization charts of the air flow over the top of the airfoil are presented

Transi by G Y

N79-22007# Office National d Etudes et de Recherches Aerospatiales Paris (France)

VORTEX PATTERN DEVELOPING ON THE UPPER SURFACE OF A SWEPT WING AT HIGH ANGLE OF ATTACK

Jean Mirande Volker Schmitt and Henri Werle In AGARD High Angle of Attack Aerodyn Jan 1979 18 p refs in FRENCH ENGLISH summary

Avail NTIS HC A23/MF A01

An experimental study based on a swept wing was undertaken in a water tunnel and a wind tunnel at low speeds (V sub o less than or equal to 90 m/s). The vortex flow effects on this wing are illustrated from global effort measurements and static pressure distributions. The domain of vortex appearance was deduced as a function of both sweep angle and angle of attack. An attempt is made to describe the physical pattern of

the vortex flow from its formation near the apex to its breakdown at the trailing edge. By means of a directional probe the flow over the wing was determined.

N79-22021# Boeing Aerospace Co Seattle Wash SUBCRITICAL DRAG MINIMIZATION FOR HIGHLY SWEPT WINGS WITH LEADING EDGE VORTICES

E N Tinoco and H Yoshihara *In* AGARD High Angle of Attack Aerodyn Jan 1979 9 p refs

Avail NTIS HC A23/MF A01

The subsonic lift to drag ratio of supercruiser type wings was studied at sufficiently large lifts for which flow separation cannot be avoided in the presence of the resulting leading edge vortex minimum drag due to lift is no longer dictated by spanwise load distribution alone but is also a function of the chordwise loading. For the resulting nonlinear problem a higher order panel method utilizing a vortex sheet model is used to search for an optimal design. A brief outline of the computational method is given fllowed by examples validating the procedures. Results of the search for an optimal camber are discussed.

N79-22022# Messerschmitt-Boelkow-Blohm G m b H Munich (West Germany)

NORMAL FORCE AND PITCHING MOMENT OF WING-BODY COMBINATIONS IN THE NONLINEAR ANGLE-OF-ATTACK RANGE AT SUBSONIC SPEEDS

C P Schneider and D Nikolitsch In AGARD High Angle of Attack Aerodyn Jan 1979 10 p refs

Avail NTIS HC A23/MF A01

Two procedures on the nonlinear lifting surface theory are presented. One method for the determination of the factor K. sub B(W) represents the effect of the wing on the body-forces and moments due to lift carry-over and predicts the normal force interference factors. The other method determines K sub-B(W) It uses the nonlinear lifting surface theory for the calculation of normal force and moment of a slowly pitching wing alone and to get the same quantities for a substitute wing which represents the original wing plus a rectangular flat middle section in place of the body between the wing root chords. The results of the two procedures call for an improved prediction method as comparable quasi-steady data from experiments which may serve to confirm the results of one or the other method are not available at present. Free vortex tracing of discrete vortices by conventional two-dimensional theory is proposed. Viscous vortices MMM with core are assumed

N79-22023*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

PREDICTION OF AERODYNAMIC CHARACTERISTICS FOR SLENDER BODIES ALONE AND WITH LIFTING SURFACES TO HIGH ANGLES OF ATTACK

Leland H Jorgensen $\it In$ AGARD High Angle of Attack Aerodyn Jan 1979 40 p refs

Avail NTIS HC A23/MF A01 CSCL 01A

A method is presented for computing normal force and pitching moment coefficients for slender bodies of circular and noncircular cross section alone and with lifting surfaces. A semiempirical term representing viscous-separation crossflow is added to a term representing potential-theory crossflow. For bodies of revolution computed aerodynamic characteristics agree with measured results for investigated free-stream Mach numbers from 0 6 to 2 9 and for angles of attack from 0 deg to 180 deg For bodies of elliptic cross section measured results are predicted well over the investigated Mach number range from 0.6 to 2.0 and the angle range from 0 deg to 60 deg. For all bodies the predictions are best at supersonic Mach numbers. For body-wing and body-wing-tail configurations measured normal force coefficients and centers are predicted at the upper test Mach number of 20 As the Mach number is decreased to 06 the agreement for the normal-force coefficients rapidly deteriorates When model flow-separation and vortex patterns are asymmetric undesirable side forces are usually measured on the models at subsonic Mach numbers and zero sideslip angle Generally the side-force coefficients decrease or vanish with increase in Mach number decrease in nose fineness ratio nose blunting and flattening of body cross section MMM M

N79-22024# Nielsen Engineering and Research Inc Mountain View Calif

PREDICTION OF LATERAL AERODYNAMIC LOADS ON AIRCRAFT AT HIGH ANGLES OF ATTACK

S B Spangler S C Perkins Jr and M R Mendenhall In AGARD High Angle of Attack Aerodyn Jan 1979 14 p refs

Avail NTIS HC A23/MF A01

The lateral loads on high speed fighter-bomber configurations at high angles of attack and small angles of sideslip were studied The configurations of interest are characterized by slender pointed noses that generate asymmetric separation vortices at angles of attack in the 25 to 45 degree range. The methods consist of a nose vortex shedding flow model a vortex lattice wing/body/ strake flow model and a tail interference model All are potential flow methods and were applied at incompressible speeds. The methods account for noncircular nose cross sections prediction of separation location on the nose and interaction between nose and strake vortices. Calculations were made to compare the predicted results with measurements of vorticity distribution velocities in the separated region and forces on noncircular noses and forces and moments on complete aircraft configurations The predicted results agree with the data show the proper trends and demonstrate the proper physical characteristics of the flow

N79-22025# Systems Research Labs Inc Newport News Va

PREDICTION AND MEASUREMENT OF THE AERODYNAMIC FORCES AND PRESSURE DISTRIBUTIONS OF WINGTALL CONFIGURATIONS AT VERY HIGH ANGLES OF ATTACK

Richard P White Jr In AGARD High Angle of Attack Aerodyn Jan 1979 16 p refs

Avail NTIS HC A23/MF A01

The three-dimensional viscous lifting surface theory that developed to predict the distribution of aerodynamic loading on arbitrary planforms having attached vortex flows at high angles of attack is discussed. Comparisons between measured and predicted performance and pressure distribution data for a wing-strake configuration at a high angle of attack are reported. Limitations of the prediction technique as well as the potential of utilizing vortex lift to amplify the performance characteristics of highly maneuverable aircraft is outlined.

N79-22026*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

HIGH ANGLE OF INCIDENCE IMPLICATIONS UPON AIR INTAKE DESIGN AND LOCATION FOR SUPERSONIC CRUISE AIRCRAFT AND HIGHLY MANEUVERABLE TRANSONIC AIRCRAFT

Leroy L Presley In AGARD High Angle of Attack Aerodyn Jan 1979 10 p refs

Avail NTIS HC A23/MF A01 CSCL 01C

The effects of angle of attack on supersonic mixed compression inlet performance at four different locations about a hypothetical forebody are given. A computational method to predict optimum inlet location orientation and centerbody control schedule for design and off-design performance is described. The effects of inlet location and a forward canard on the angle-of-attack performance of a normal shock inlet at transonic speeds were studied. Proper integration of inlet location and a forward canard can enhance the angle-of-attack performance of a normal shock inlet. Two lower lip treatments for improving the angle-of-attack performance of rectangular inlets at transonic speeds are discussed.

N79-22027# Messerschmitt-Boelkow-Blohm G m b H Munich (West Germany) Military Airplane Div

INTAKE DESIGN AND INTAKE/AIRFRAME INTEGRATION FOR A POST-STALL FIGHTER AIRCRAFT CONCEPT

K W Lotter and J Malefakis *In* AGARD High Angle of Attack Aerodyn Jan 1979 16 p refs

Avail NTIS HC A23/MF A01

Results from subsonic scale model tests carried out for intake geometries especially designed for high angle of attack capability are discussed. A unit-composed intake model representing a twin-engine fighter aircraft was tested with two basic intake positions in a shielded location one under the fuselage and one under the wing strakes on both sides of the fuselage Two different axial positions were tested. An external compression horizontal ramp inlet design was chosen for the tests Different auxiliary intakes, all fitted to the lower side of the intake were tested. Various rotatable forward cowl lip designs and a cowl slot were included in the investigations. A shielded intake location offers a high potential for improvement in inlet maneuver capability. Sufficient shielding is generally given for the under-fuselage position. For the side-intakes located under the strakes a position as far downstream as possible is desirable For such shielded intakes only small performance losses occurred at incidences up to 35 deg. Variable cowl lip geometry introduced for subsonic maneuver improvement offers an attractive means for optimum intake/engine mass flow matching at supersonic speeds by varying the intake capture area

N79-22029# Royal Inst of Tech Stockholm (Sweden) Dept of Aeronautics

WIND TUNNEL TEST AT LOW SPEEDS OF A DORSAL AIR INTAKE ON A FIGHTER CONFIGURATION

Sven-Olof Ridder In AGARD High Angle of Attack Aerodyn

Sven-Olof Hidder /// AGARD High Angle of Affack Aerodyn Jan 1979 3 p Avail NTIS HC A23/MF A01

A wind tunnel model with a swept wing and a dorsal air intake mounted well aft on the fuselage was investigated in a low speed wind tunnel with respect to the flow quality of the air intake flow. It was found that the air intake flow was satisfactory at zero angle of yaw for angles of attack up to 20 degrees. Even a moderate angle of yaw however resulted in a rather high level of intake flow distortion as caused by the ingestion of forebody vortices. A large number of forebody mounted flow control devices were tested and among these only a canopy mounted device was found effective in reducing the intake flow.

N79-22030# Avions Marcel Dassault-Breguet Aviation Saint-Cloud (France)

VISUALISATIONS AND CALCULATIONS OF AIR INTAKES AT HIGH ANGLES OF ATTACK AND LOW REYNOLDS NUMBER

P C Perrier and J Periaux In AGARD High Angle of Attack Aerodyn Jan 1979 2 p refs in FRENCH

Avail NTIS HC A23/MF A01

distortion to an acceptable level

The operation of compressors can be strongly perturbed at a high angle of incidence by the instability of the flow created by separation at the edges of the air intake. Both flow visualization and the direct solution numerical solution of the Navier-Stokes equation are complementary methods of analyzing the phenomena To visualize what is intervening at the interior of the air intake the flow can be studied at very low velocity and at a low Reynolds number by the injection of colored fluid in a two dimensional flow in a hydrodynamic test tunnel so that an ultra ultra-rapid film of the transonic stream lines can be obtained The instability of the separation of at the air intake can be calculated only by the exact or approximate solution of the Navier-Stokes equation Results obtained by using a least squares finite element method for the direct solution of the Navier-Stokes instability equation are presented. This method resolves the nonlinearity of the equation by iteration of the Stokes equation which is itself resolved in an original manner. Transl by ARH

N79-22032# Bristol Univ (England) Dept of Aeronautical Engineering

ON SLENDER WINGS WITH LEADING EDGE CAMBER

R K Nangia In AGARD High Angle of Attack Aerodyn Jan 1979 10 p refs

Avail NTIS HC A23/MF A01

The presence of leading edge camber on wing or wing body configuration of low aspect ratio is known to improve their aerodynamic efficiency. A research program to develop design methods on this subject is reviewed

N79-22033# Technische Hogeschool Delft (Netherlands) Dept of Aerospace Engineering

AN EXPERIMENTAL INVESTIGATION OF THE ENTRAIN-MENT OF A LEADING-EDGE VORTEX

N G Verhaagen and L vanderSnoek In AGARD High Angle of Attack Aerodyn Jan 1979 5 p refs

Avail NTIS HC A23/MF A01

An experimental investigation of the flow field of a leading edge vortex produced by a sharp edged unit aspect ratio delta wing at an angle of attack of 20 deg was carried out at 45 m/sec Velocity and total pressure distributions were obtained by using a fixed-attitude five-hole probe. On the basis of the experimental results a number of control volumes of different cross sectional dimensions enclosing the rotational vortex core were chosen For each of the control volumes the entrainment was esti-

N79-22034# Aeritalia Sp A Torino (Italy) Combat Aircraft

A SURVEY OF RECENT HIGH ANGLE OF ATTACK, WIND TUNNEL TESTING AT AERITALIA

G Bucciantini R DeSilvestro and L Fornaster In AGARD High Angle of Attack Aerodyn Jan 1979 4 p refs

Avail NTIS HC A23/MF A01

The present status of investigation on wind tunnel testing techniques at high angles of attack and on stall/post stall characteristics of configurations typical of modern combat aircraft is illustrated Author

N79-22035*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

LOW-SPEED WIND-TUNNEL INVESTIGATION OF A LARGE-SCALE VTOL LIFT-FAN TRANSPORT MODEL

Kıyoshı Aoyagı Apr 1979 72 p refs

(NASA-TM-78560 A-7734) Avail NTIS HC A04/MF A01 CSCL 01A

An investigation was conducted in the NASA-Ames 40 by 80 Foot Wind Tunnel to determine the aerodynamic characteristics of a large scale VTOL lift fan jet transport model. The model had two lift fans at the forward portion of the fuselage a lift fan at each wing tip and two lift/cruise fans at the aft portion of the fuselage All fans were driven by tip turbines using T-58 gas generators. Results were obtained for several lift fan exit vane deflections and lift/cruise fan thrust deflections are zero sideslip. Three component longitudinal data are presented at several fan tip speed ratios. A limited amount of six component data were obtained with asymmetric vane settings. All of the data were obtained without a horizontal tail. Downwash angles at a typical tail location are also presented

N79-22036*# Colorado State Univ Fort Coilins Dept of

EFFECTS OF TURBULENCE ON LAMINAR SEPARATION ON AERODYNAMIC SURFACES SUCH AS AIRFOILS AND COMPRESSOR BLADING Semiannual Status Report, 1 Oct 1978 - 31 Mar 1979

Willy Z Sadeh Apr 1979 8 p refs

(Grant NsG-3127)

(NASA-CR-158488 CSU-31-1372-1935) NTIS Avail HC A02/MF A01 CSCL 01A

Activities report include (1) completion of measurements of turbulence amplification in flow about a circular cylinder (2) initiation of the measurements of turbulence characteristics in flow about a single symmetric airfoil and (3) further examination of various matching numerical methods. Emphasis is placed on the experimental program conducted to obtain data

on the amplification of the oncoming turbulence and its management

N79-22037*# National Aeronautics and Space Administration Langley Research Center Hampton Va

EXPERIMENTAL INVESTIGATION OF THREE HELICOPTER ROTOR AIRFOILS DESIGNED ANALYTICALLY

Gene J Bingham and Kevin W Noonan Apr 1979 95 p refs. Prepared in cooperation with Army Aviation Res. and Develop Command Hampton Va

(DA Proj 1L1-61102-AH-45)

(NASA-TP-1396 L-11703 AVRAD COM-TR-79-11) Avail NTIS HC A05/MF A01 CSCL 01A

Three helicopter rotor airfoils designed analytically were investigated in a wind tunnel at Mach numbers from about 0.30 to 090 and Reynolds from about 08 to 23 x 10 to the 6th power The airfoils had thickness-to-chord ratios of 0.08 0.10 and 0.12 with maximum thickness at 40 percent chord. The camber distribution of each section was the same with maximum camber at 35 percent chord. The 10-percent-thick airfoil was also investigated at Reynolds numbers from 48 to 94 x 10 to the 6th power. The drag divergence Mach number of the 10-percent-thick airfoil is about 0.83 at a normal-force coefficient of 0 and about 0.72 at a normal-force coefficient of 0.6 at Reynolds numbers near 9 x 10 to the 6th power The maximum normal-force coefficient is slightly less than that of the NACA 0012 airfoil tested in the same facility. The results indicate that a qualitative evaluation of the drag divergence can be made at normal-force coefficients up to the onset of boundary-layer separation by analytically predicting the onset of sonic flow at the airfoil crest. The qualitative results are conservative with respect to experimental values with the experimental drag divergence Mach number up to 0.05 higher than that indicated by analysis

N79-22038* # National Aeronautics and Space Administration Langley Research Center Hampton Va

LOW-SPEED WIND-TUNNEL PARAMETRIC INVESTIGA-TION OF FLIGHT SPOILERS AS TRAILING-VORTEX-ALLEVIATION DEVICES ON A TRANSPORT AIRCRAFT MODEL

Delwin R Croom Washington Apr 1979 46 p refs (NASA-TP-1419 L-12622) Avail NTIS HC A03/MF A01

The trailing-wing sensor technique was used in the Langley V/STOL tunnel to determine the effectiveness of 11 combinations of the existing flight-spoiler segments on a jumbo-jet transport aircraft model when they were deflected as trailing-vortexalleviation devices. All 11 of the flight-spoiler configurations investigated were effective in reducing the induced rolling moment on the trailing model. This investigation is an extension of earlier wind-tunnel and flight tests which showed that the existing flight spoilers on the jumbo-jet aircraft can be used as effective trailing-vortex-alleviation devices Essentially all of the reduction in induced rolling moment on the trailing-wing model was realized at a spoiler deflection of 45 deg for single-spoiler configurations 30 for two-spoiler configurations and 15 deg for both the threeand four-spoiler configurations. Of the 11 flight-spoiler configurations investigated the most promising configuration for trailingvortex abatement on the jumbo-jet aircraft appears to be the three inboard flight spoilers deflected 15 deg ARH

N79-22039*# Boeing Vertol Co Philadelphia Pa ROTARY-WING AERODYNAMICS VOLUME 1 BASIC THEORIES OF ROTOR AERODYNAMICS WITH APPLICA-TION TO HELICOPTERS

W Z Stepniewski Washington NASA Jan 1979 302 p refs

(Contract NAS2-7007)

(NASA-CR-3082) Avail NTIS HC A14/MF A01 CSCL 01A

The concept of rotary-wing aircraft in general is defined The energy effectiveness of helicopters is compared with that of other static thrust generators in hover as well as with various air and ground vehicles in forward translation. The most important aspects of rotor-blade dynamics and rotor control are reviewed The simple physicomathematical model of the rotor offered by the momentum theory is introduced and its usefulness and limitations are assessed. The combined blade-element and momentum theory approach which provides greater accuracy in performance predictions, is described as well as the vortex theory which models a rotor blade by means of a vortex filament or vorticity surface. The application of the velocity and acceleration potential theory to the determination of flow fields around three dimensional non-rotating bodies as well as to rotor aerodynamic problems is described. Airfoil sections suitable for rotors are also considered.

N79-22040*# Battelle Columbus Labs Ohio EXTENDED ANALYTICAL STUDY OF THE FREE-WING/ FREE-TRIMMER CONCEPT Final Report

Richard F Porter David W Hall and Rodolfo D Vergara Apr 1979 95 p refs

(Contract NAS4-2498)

(NASA-CR-3135) Avail NTIS HC A05/MF A01 CSCL 01A The free wing/free trimmer concept was analytically studied in order to (1) compare the fore and aft trimmer configurations

in order to (1) compare the fore and aft trimmer configurations on the basis of equal lift capability rather than equal area (2) assess the influence of tip mounted aft trimmers both free and fixed on the lateral directional modes and turbulence responses (3) examine the feasibility of using differential tip mounted trimmer deflection for lateral control (4) determine the effects of independent fuselage attitude on the lateral directional behavior and (5) estimate the influence of wing sweep on dynamic behavior and structural weight Results indicate that the forward trimmer concept is feasible with the reduced size examined but it remains inferior to the aft trimmer in every respect except structural weight Differential motion of the aft trimmer is found to provide powerful lateral control while the effect of fuselage deck angle is a reduction of the dutch roll damping ratio for nose-down attitudes.

N79-22041*# Applied Physics Lab Johns Hopkins Univ Laurel Md

BUMBLEBEE PROGRAM AERODYNAMIC DATA PART 4 WING LOADS AT MACH NUMBERS 15 AND 20 Final Report

G A Barnes and L L Cronvich Washington NASA Apr 1979 46 p ref

(NASA Order L-60036-A)

(NASA-CR-3117) Avail NTIS HC A03/MF A01 CSCL 01A Individual wing panel aerodynamic characteristics are provided for rectangular wings with aspect ratios of 0.25 0.75 and 1.00 each panel at Mach numbers if 1.5 and 2.0 for angles of attack to 2.3 degrees Data plots produced from reports of wind tunnel tests show normal force coefficients, and the spanwise and chordwise center of pressure locations.

N79-22046*# Vought Corp Hampton, Va

AERODYNAMIC DESIGN AND ANALYSIS OF THE AST-200 SUPERSONIC TRANSPORT CONFIGURATION CONCEPT Kenneth B Walkley and Glenn L Martin Apr 1979 47 p. ofe.

(Contract NAS1-13500)

(NASA-CR-159051) Avail NTIS HC A03/MF A01 CSCL 01A

The design and analysis of a supersonic transport configuration was conducted using linear theory methods in conjunction with appropriate constraints. Wing optimization centered on the determination of the required twist and camber and proper integration of the wing and fuselage. Also included in the design are aerodynamic refinements to the baseline wing thickness distribution and nacelle shape. Analysis to the baseline and revised configurations indicated an improvement in lift-to-drag ratio of 0.36 at the Mach 2.7 cruise condition. Validation of the design is planned through supersonic wing tunnel tests.

N79-22051*# National Aeronautics and Space Administration Langley Research Center Hampton Va

SURFACE PRESSURE DATA FOR A SUPERSONIC-CRUISE AIRPLANE CONFIGURATION AT MACH NUMBERS OF 2 30, 2 96, 3 30 Barrett L Shrout William A Corlett and Ida K Collins May 1979 56 p refs (NASA-TM-80061 L-12777) Avail NTIS HC A04/MF A01

(NASA-IM-8006) L-12777) Avail NTIS HC A04/MF A01 CSCL 01A

The tabulated results of surface pressure tests conducted on the wing and fuselage of an airplane model in the Langley Unitary Plan wind tunnel are presented without analysis. The model tested was that of a supersonic-cruise airplane with a highly swept arrow-wing planform two engine nacelles mounted beneath the wing and outboard vertical tails. Data were obtained at Mach numbers of 2.30 2.96 and 3.30 for angles of attack from -4 deg to 12 deg. The Reynolds number for these tests was 6.560.000 per meter.

N79-22052*# United Technologies Research Center East Hartford Conn

THE INFLUENCE OF SWEEP ON THE AERODYNAMIC LOADING OF AN OSCILLATING NACA 0012 AIRFOIL. VOLUME 1 TECHNICAL REPORT Final Report

A O St Hilaire F O Carta M R Fink and W D Jepson (Sikorsky Aircraft) May 1979 138 p refs (Contract NAS1-14873)

(NASA-CR-3092) Avail NTIS HC A07/MF A01 CSCL 01A Aerodynamic experiments were performed on an oscillating NACA 0012 airfoil utilizing a tunnel-spanning wing in both unswept and 30 degree swept configurations. The airful was tested in steady state and in oscillatory pitch about the quarter chord. The unsteady aerodynamic loading was measured using pressure transducers along the chord Numerical integrations of the unsteady pressure transducer responses were used to compute the normal force chord force and moment components of the induced loading. The effects of sweep on the induced aerodynamic load response was examined. For the range of parameters tested it was found that sweeping the airfoil tends to delay the onset of dynamic stall. Sweeping was also found to reduce the magnitude of the unsteady load variation about the mean response. It was determined that at mean incidence angles greater than 9 degrees, sweep tends to reduce the stability margin of the NACA 0012 airfoil however for all cases tested the airfoil was found to be stable in pure pitch. Turbulent eddies were found to convect downstream above the upper surface and generate forward-moving acoustic waves at the trailing edge which move upstream along the lower surface JMS

N79-22057# Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept

AERODYNAMIC CHARACTERISTICS OF THE CLOSE-COUPLED CANARD AS APPLIED TO LOW-TO-MODERATE SWEPT WINGS VOLUME 1 GENERAL TRENDS Final Report, 1970 - 1974

David W Lacey Jan 1979 68 p ref (WF1412109)

(AD-A063819 AERO-1256-Vol-1 DTNSRDC-79-001-Vol-1) Avail NTIS HC A04/MF A01 CSCL 01/3

A summary of the general findings of close-coupled canard research at David W Taylor Naval Ship Research and Development Center is presented. These findings are based on a series of wind-tunnel evaluations utilizing an aircraft research model having wings of either 25 or 50 degree leading edge sweep. Discussed is the effect of canard placement on lift, drag and pitching moment and the location of optimum position for canards of different planform. In addition, the effects of canard-wing interference canard deflection size and Mach number are described.

N79-22061*# National Aeronautics and Space Administration Langley Research Center Hampton Va

DEMAND FOR LARGE FREIGHTER AIRCRAFT AS PROJECTED BY THE NASA CARGO/LOGISTICS AIRLIFT SYSTEM STUDIES

Allen H Whitehead Jr and William H Kuhlman (McDonnel-Douglas Corp.) Apr 1979 34 p refs Presented at the AIAA Very Large Vehicle Conf. Arlington Va 26-27 Apr 1979 (NASA-TM-80074) Avail NTIS HC A03/MF A01 CSCL 01C

The market conditions are examined up through the year 2008 to provide a preliminary assessment of the potential

for and the characteristics of an advanced all-cargo transport aircraft. Any new freighter must compete with current wide-body aircraft and their derivatives. Aircraft larger than the wide-bodies may incur economic penalties and operational problems. A lower direct operating cost is not a sufficient criterion to base a decision for the initiation of a new aircraft development or to select aircraft characteristics. Other factors of equal importance that are reviewed in this paper include considerations of the system infrastructure the economics of the airlines and the aircraft manufacturer return on investment. The results of the market forecast and a computer simulation show that an advanced long range aircraft with a payload between 68 to 181 tonnes (75 to 200 tons) could generate a solid foothold beginning around 1994.

N79-22062*# Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics

AN ANALYSIS OF LONG AND MEDIUM-HAUL AIR PASSENGER DEMAND, VOLUME 1 Final Report

Steven E Eriksen 1978 75 p refs (Grant NsG-2129)

(NASA-CR-152156) Avail NTIS HC A04/MF A01 CSCL

A basic model was developed which is a two equation pair econometric system in which air passenger demand and airline level-of-service are the endogenous variables. The model aims to identify the relationship between each of these two variables and its determining factors and to identify the interaction of demand and level-of-service with each other. The selected variable for the measure of air passenger traffic activity in a given pair market is defined as the number of passengers in a given time that originate in one region and fly to the other region for purposes other than to make a connection to a third region. For medium and long haul markets the model seems to perform better for larger markets. This is due to a specification problem regarding the route structure variable. In larger markets, a greater percentage of nonlocal passengers are accounted for by this variable Comparing the estimated fare elasticities of long and medium haul markets it appears that air transportation demand is more price elastic in longer haul markets. Long haul markets demand will saturate with a fewer number of departures than will demand in medium haul markets ARH

N79-22063*# Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics

AN ANALYSIS OF SHORT HAUL AIR PASSENGER DEMAND, VOLUME 2 Final Report

Terry P Blumer and William M Swan 1978 132 p refs (Grant NsG-2129)

(NASA-CR-152157) Avail NTIS HC A07/MF A01 CSCL 05C

Several demand models for short haul air travel are proposed and calibrated on pooled data. The models are designed to predict demand and analyze some of the motivating phenomena behind demand generation. In particular an attempt is made to include the effects of competing modes and of alternate destinations The results support three conclusions (1) the auto mode is the air mode's major competitor (2) trip time is an overriding factor in intermodal competition with air fare at its present level appearing unimportant to the typical short haul air traveler and (3) distance appears to underly several demand generating phenomena and therefore must be considered very carefully to any intercity demand model. It may be the cause of the wide range of fare elasticities reported by researchers over the past 15 years. A behavioral demand model is proposed and calibrated It combines the travel generating effects of income and population the effects of modal split the sensitivity of travel to price and time and the effect of alternative destinations satisfying the trip purpose ARH

N79-22064*# Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics

AN ECONOMIC MODEL OF THE MANUFACTURERS' AIRCRAFT PRODUCTION AND AIRLINE EARNINGS POTENTIAL, VOLUME 3 Final Report James T Kneafsey and Richard M Hill 1978 185 p refs (Grant NsG-2129) (NASA-CR-152158) Avail NTIS HC A09/MF A01 CSCL

A behavioral explanation of the process of technological change in the U.S. aircraft manufacturing and airline industries is presented. The model indicates the principal factors which influence the aircraft (airframe) manufacturers in researching developing constructing and promoting new aircraft technology and the financial requirements which determine the delivery of new aircraft to the domestic trunk airlines. Following specification and calibration of the model the types and numbers of new aircraft were estimated historically for each airline's fleet Examples of possible applications of the model to forecasting an individual airline's future fleet also are provided. The functional form of the model is a composite which was derived from several preceding econometric models developed on the foundations of the economics of innovation acquisition and technological change and represents an important contribution to the improved understanding of the economic and financial requirements for aircraft selection and production. The model's primary application will be to forecast the future types and numbers of new aircraft required for each domestic airline's fleet

N79-22065*# Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics

THE IMPACT OF CHANGING TECHNOLOGY ON THE DEMAND FOR AIR TRANSPORTATION Final Report James T Kneafsey and Nawal K Taneja 1978 27 p refs (Grant NsG-2129)

(NASA-CR-152191) Avail NTIS HC A03/MF A01 CSCL 05C

Demand models for air transportation that are sensitive to the impact of changing technology were developed. The models are responsive to potential changes in technology, and to changing economic social and political factors as well. In addition to anticipating the wide differences in the factors influencing the demand for long haul and short haul air travel the models were designed to clearly distinguish among the unique features of these markets.

N79-22066# Air Force Flight Dynamics Lab, Wright-Patterson AFB Ohio LIGHTNING TRANSIENT RESEARCH ON AN F-111E

AIRCRAFT Final Report, Jun - Dec 1976
Vernon L Mangold and Lawrence C Walko Feb 1978 105 p

Vernon L Mangold and Lawrence C Walko Feb 1978 105 prefs

(AD-A063765 AFFDL-TR-78-1) Avail NTIS HC A06/MF A01 CSCL 01/2

A simulated lightning test was conducted on an F-111E aircraft (S/N 67-116A) to field test improved measurement techniques and to record and evaluate induced transient voltages on selected electrical circuits to determine their susceptibility to lightning. Technical improvements included (1) a pneumatic system. to trigger the simulated lightning current-producing capacitor bank (2) a change in configuration of current return leads (3) specially designed breakout boxes and cables (4) a fiber optics measurement system and (5) a Tektronix transient digitizer data recording system. The standard 2 x 50 microsecond current pulse was applied to the aircraft (nose-to-tail) and induced voltages were measured and recorded both in the time and frequency domains on 17 different circuits with power off in the aircraft The magnitude of the current pulse was varied from 0.5 to 5.5 kiloamperes but most measurements were made at Measurements were made on flight critical 2.5 kiloamperes circuits of the Altitude-Vertical Speed amplifiers the Yaw and Roll computers and the Roll Rate Gyro in the Feel and Trim assembly on the tail light and right and left wing position light circuits on the fuel indication circuits, and on the pitot heater circuit (with and without a transient suppressor device). Power-on measurements made on four damper servo circuits resulted in substantially higher induced voltage amplitudes than with power off Changing aircraft ground points did not affect the magnitude or waveshape of induced transients

N79-22067# Defence and Civil Inst of Environmental Medicine Downsview (Ontario)

TEST AND EVALUATION OF MODIFIED HIGH PERFORMANCE JET AIRCREW LIFE PRESERVER

J A Firth and J C Steffler Nov 1978 22 p refs (AD-A063959 DCIEM-TR-78X36) Avail NTIS HC A02/MF A01 CSCL 06/7

At the request of NDHQ DCIEM evaluated several proposed Automatic Inflation Device (AID) pocket modifications for the high performance jet aircrew life preserver. Two Irvin proposals and two modified pockets developed at DCIEM were compared with the existing AID pocket in terms of manual pull force and automatic inflation times. Although no significant differences were noted between the four prototypes an improved AID pocket resulting from DCIEM/DAES collaboration was considered best suited for CF use.

N79-22068*# Systems Control, Inc. West Palm Beach Fla
GENERAL AVIATION IFR OPERATIONAL PROBLEMS
Eric H Bolz and Janice E Eisele Apr 1979 218 p refs
(Contract NAS1-15313)

(NASA-CR-159022) Avail NTIS HC A10/MF A01 CSCL 17G

Operational problems of general aviation IFR operators (particularly single pilot operators) were studied. Several statistical bases were assembled and utilized to identify the more serious problems and to demonstrate their magnitude. These bases include official activity projections historical accident data and delay data among others. The GA operating environment and cockpit environment were analyzed in detail. Solutions proposed for each of the problem areas identified are based on direct consideration of currently planned enhancements to the ATC system and on a realistic assessment of the present and future limitations of general aviation avionics. A coordinated set of research program is suggested which would provide the developments necessary to implement the proposed solutions.

N79-22069# Norwegian Defence Research Establishment Kieller

FACTORS AFFECTING OMEGA ACCURACY

T R Larsen E R Swanson (Naval Ocean Systems Center San Diego Calif) and E V Thrane Dec 1978 32 p refs Sponsored in part by ONR

(NDRE-71 ISSN-0085-4301) Avail NTIS HC A03/MF A01
Factors affecting the navigational accuracy of Omega
include system geometry phase prediction models phase
measureability and signal phase repeatability A discussion of
these subjects is given with emphasis on the latter topic
Experimental phase data from Omega monitoring at high latitudes
are presented. The effects of solar X ray flares and solar proton
events on Omega positional accuracy are evaluated.

N79-22070# Old Dominion Systems Inc Gaithersburg Md USER'S GUIDE TO DATA PREPARATION PHOTOGRAMMETRIC NAVIGATION ANALYSIS PROGRAM FOTONAP Georg E Morduch and David A Bergeron Sep 1978 123 p (Contract DAAK70-77-C-0254)

(AD-A064614 ETL-0174) Avail NTIS HC A06/MF A01 CSCL 17/7

This report is a user's guide for the photogrammetric navigation analysis program (generally referred to as fotonap) designed to provide the user with a detailed description of the control information needed to run fotonap

Author (GRA)

N79-22071# Old Dominion Systems Inc Gaithersburg Md KALMAN FILTERING AND SMOOTHING IN FOTONAP FOR ORBIT DETERMINATION USING GPS MEASUREMENTS Final Report

Georg E Morduch and David A Bergeron Sep 1978 139 p. refs

(Contract DAAK70-77-C-0254)

(AD-A064613 ETL-0161) Avail NTIS HC A07/MF A01 CSCL 17/7

The Fotonap program has been modified to incorporate a Kalman filter and a fixed lag smoother, the capability to handle GPS measurements through the filter/smoother a Lockheed-Jacchia dynamic atmospheric model, a discretely changing atmospheric drag coefficient (drag segmentation) and the capability to accept as input to the regular Fotonap the output from the filter/smoother including the full covariance matrix. The derivation of all the required equations is given in this report Updated versions of Fotonap exist for both CDC 6400 and Univac 1108 computers.

N79-22072# Air Force Inst of Tech Wright-Patterson AFB, Ohio School of Engineering

ERROR MODEL VERIFICATION FOR A THREE AXIS LASER GYRO STRAPDOWN INERTIAL MEASUREMENT UNIT M S Thesis

Robert S Lawrence Dec 1978 100 p refs (AD-A064047, AFIT/GGC/EE/78-8) Avail NTIS HC A05/MF A01 CSCL 17/7

A digital data acquisition system was developed to obtain data from a Sperry laser dyroscope strapdown inertial measurement unit for error model verification. The system consisted of a laboratory test set-up with the inertial measurement unit (IMU) on the Genisco rate table and input/output interfaces such that meaningful IMU sensor data was recorded on magnetic tape with absence of a microprocessor. The recorded data was processed on the CDC 6600 digital computer by a specially developed program which formats the data in accordance to desired specifications. The calibration sequence for error model verification was a 6-position dynamic test for the laser gyros and a 6-position static test for the accelerometers. The result is a reliable and flexible system that can obtain data from the IMU in the laboratory for analysis.

N79-22073# Air Force Global Weather Central Offutt AFB Nebraska

ENVIRONMENTAL EFFECTS ON VLF NAVIGATION SYSTEMS. OMEGA

Edward D Beard Dec 1978 32 p refs (AD-A063882 AFGWC-TM-78-004) Avail NTIS HC A03/MF A01 CSCL 17/7

Very Low Frequency (VLF) (3-30 khz) radio waves are exceptionally useful for long range navigation systems such as the OMEGA Anomalies in the earth's upper atmosphere specifically the ionosphere can introduce significant errors into these systems. The technical memorandum describes these anomalies and introduces the products available from AFGWC which may help the navigator to better utilize the navigation system.

Author (GRA)

N79-22074# Naval Surface Weapons Center Dahlgren Va AN EFFICIENT ALGORITHM FOR COMPUTING THE Q-GUIDANCE MATRIX Final Report

William L Davis Jan 1979 34 p (AD-A064816 NSWC/DL-TR-3844) Avail NTIS HC A03/MF A01 CSCL 17/7

This paper derives a new method for computing the Q-guidance matrix. This matrix is defined as the derivative with respect to position of the correlated velocity V sub C ie the velocity required to reach a given target in a specified time in an inverse-square gravitational field. The method is completely analytic and yields a simple and efficient algorithm. The analytic equation for the partial derivative of the horizontal component of correlated velocity with respect to range angle developed here is also of independent interest. To the author's knowledge no such expression for this quantity in terms of the given conditions and the components of V sub C has been derived previously This equation in conjunction with the others given here makes it possible to compute virtually any (first order) derivative of V sub C of interest. The Q-matrix algorithm is of use primarily in the analysis and modeling of guidance systems using some form of V sub G steering Author (GRA)

N79-22076* Boeing Vertol Co Philadelphia Pa
IDENTIFICATION OF HIGH PAYOFF RESEARCH FOR MORE

EFFICIENT APPLICATOR HELICOPTERS IN AGRICULTURE AND FORESTRY

Kenneth T Waters May 1979 84 p refs

(Contract NAS2-10040)

(NASA-CR-152258 D210-11193-1) NTIS Avail

HC A06/MF A01 CSCL 01C

The results of a study of the uses of helicopters in agriculture and forestry in the United States are discussed Comparisons with agricultural airplanes are made in terms of costs of aerial application to the growers. An analysis of cost drivers and potential improvements to helicopters that will lower costs is presented Future trends are discussed and recommendations for research are outlined Operational safety hazards and accident records are examined and problem areas are identified. Areas where research and development are needed to provide opportunities for lowering costs while increasing productivity are analyzed

N79-22077# Army Aviation Engineering Flight Activity Edwards AFB Calif

ENGINEER DESIGN TEST 1, HUGHES YAH-64, ADVANCED ATTACK HELICOPTER Final Report

Richard C Tarr Robert L Stewart Ralph Woratschek and Vernon L Diekmann Sep 1978 158 p refs

(AD-A064359 USAAEFA-77-36) Avail NTIS

HC A08/MF A01 CSCL 01/3

A Handling Qualities Evaluation Engineer Design Test 1 was conducted of the Hughes Helicopter Company YAH-64 advanced attack helicopter from 22 April 1978 through 1 May 1978 at Palomar Airport Carlsbad CA (elevation 320 feet) A total of 15 flights were conducted during 21 8 hours (17 4 hours productive) The objectives of the test were to reevaluate certain flight characteristics which were undesirable during Phase 1 testing and to assess the effect of design changes on aircraft handling qualities. This phase of the aircraft development was not intended to address all of the undesirable flight characteristics uncovered during the Phase 1 testing. Many enhancing characteristics deficiencies and shortcomings reported during the government competitive test (GCT) remain valid. The YAH-64 continues to have the potential to be developed into an excellent attack helicopter

N79-22078# Effects Technology Inc Santa Barbara, Calif DYNAMIC BEHAVIOR OF AIRCRAFT MATERIALS Final Report, 15 Feb - 31 Dec 1977

Frederic A Bick and Pamela VanBlaricum 28 Feb 1978 129 p refs

(Contract DNA001-77-C-0103)

(AD-A064592 AD-E300446 ETI-CR-78-485 DNA-4545F) Avail NTIS HC A07/MF A01 CSCL 01/3

Dynamic high strain rate loading characterization of two composite materials that are being used today in the design of military and commercial aircraft was accomplished. Of particular concern was the response of such materials to nuclear blast and thermal environments. Primary emphasis is placed on the graphite epoxy designated AS/3501-6 as would be used in body or wing panels. Of secondary emphasis is the quartz polyimide designated F178/581 a radome material materials were tested quasistatically and dynamically (strain rates up to 18 inches/in/sec) and from -65F to above resin cure temperature (Cure temperatures of 350F for the graphite epoxy and 475F for the quartz polyimide). Test results indicated that both materials were stronger under dynamic loads than quasistatic loads Additionally at elevated temperatures the responses were dramatically different with the dynamic properties exhibiting little or no degradation due to temperature effects while quasistatic properties decreased significantly with temperature Author (GRA)

N79-22079# Ballistic Research Labs Aberdeen Proving Ground

HIGHLY SURVIVABLE TRUSS TAIL BOOM

Thomas F Erline Nov 1978 175 p refs (AD-A064181 AD-E430172 ARBRL-TR-02123) Avail NTIS HC A08/MF A01 CSCL 01/3

Highly redundant truss type structures, which are lightweight

1

have been analyzed by NASTRAN for replacement of the semimonocoque type tail boom. Analyses show that even with massive damage criterion imposed the structure retains its integrity with level flight loads up to 130 knots. The truss presents itself as a structural challenge to Soviet AA threat of the 23mm and 30mm HEI rounds. Comparing the vulnerable semimonocoque configuration with the truss structure semimonocoque's vulnerable area is nearly 100% of the present area the truss has a greatly reduced vulnerable area (the joints are most vulnerable and their areas are small) The semimonocoque is blast sensitive to the AA threats mentioned because the detonation is confined and a large surface area is blown away, the truss does not confine the blast thus is less sensitive thin skin structure of the semimonocoque carries a great deal of load it is sensitive to crack propagation, the truss is insensitive to crack propagation. Since the truss can be easily designed lightweight, the truss presents itself as a highly survivable competitive alternate for future Army helicopters Author (GRA)

N79-22080# Kaman Aircraft Corp Bloomfield Conn PRELIMINARY DESIGN STUDY OF A COMPOSITE MAIN HELICOPTER BLADE FOR THE OH-58 ROTOR VOLUME 1 TRADE ANALYSIS AND PRELIMINARY DESIGN STUDY OF COMPOSITE OH-58 MAIN ROTOR BLADE Final Report, Oct 1977 - Feb 1978 Charles Hardersen and William Blackburn Sep 1978 212 p

(Contract DAAJ02-77-C-0075 DA Proj 1L2-62209-AH-76) (AD-A064159 R-1532-Vol-1 USARTL-TR-78-29A) Avail NTIS HC A10/MF A01 CSCL 01/3

The objective of this program was to design a composite rotor blade for the OH-58C/A helicopter which has reduced life-cycle costs 6% improved hover performance improved reliability and maintainability reduced radar signature and increased ballistic survivability. A trade-study approach was used to select the final configuration for the preliminary design phase A monolithic composite structure evolved which utilizes winding in the production of the main spar skins and the trailing edge spline. The blade satisfies basic objectives using a doubletapered planform and a VR-7 airfoil. Composite materials selected include S-glass E-glass and carbon graphite

N79-22081# Army Research and Technology Labs Fort Eustis

CH-47 HELICOPTER INTERNAL CARGO LOAD AND RESTRAINT SYSTEM MOCK-UP STUDY Technical Note, Aug 1977 - Nov 1978

NTIS

John F Tansey Nov 1978 17 p

USARTL-TN-32) (AD-A064207)

HC A02/MF A01 CSCL 01/3

A conceptual CH-47 helicopter internal cargo load and restraint system was designed and a ponflightworthy functional mock-up of the system was constructed Mock-up components consisted of a rail/roller and support grid fore-and-aft cargo barriers and a ball transfer table. The system was tested in a CH-47 and proved to be easily installed without aircraft modification Ease of use with standard Army warehouse pallets and USAF 463 pallets was demonstrated. It was concluded that the system has potential for maximizing aircraft payload capabilities and improving cargo handling procedures significantly. The same technology could also be made applicable to utility helicopters Author (GRA)

N79-22082# Computer Sciences Corp Silver Spring Md System Sciences Div

THE PREDESIGN PHASE OF THE SECOND-GENERATION COMPREHENSIVE HELICOPTER ANALYSIS SYSTEM Final Report, 8 Sep 1977 - 22 May 1978

Oct 1978 396 p refs Prepared for Army Res and Technol Labs

(Contract DAAJ02-77-C-0057 DA Proj 1L2-63211-D-157) USARTL-TR-78-41) (AD-A063921 Avail NTIS HC A17/MF A01 CSCL 01/3

This report summarizes the results of the Predesign Phase work for the Second-Generation Comprehensive Helicopter Analysis System The report includes an executive summary

summarizes a conceptual design for the System describes the System's capability provided in the First Level Release and Second Level Release discusses how the System would be used presents a summary of the plans for development of the System and presents discussions of risk considerations. The objectives and life cycle of the System are presented in terms of the six life-cycle phases planning predesign development validation maintenance and user applications Predesign Phase objectives and results are discussed. An overview of the System design is provided for the engineering manager, the engineering user, and the programmer. Four major design characteristics that the System must possess for it to be universally accepted by the helicopter analysis community are discussed user orientation efficiency transportability and extendability. The mathematical basis for the System is presented in terms of the types of problems to be solved by the System the finite element approach the coupling of components aerodynamic effects and numerical analysis considerations. The System's software architecture is presented hierarchically

N79-22083# Control Data Corp Hampton Va PREDESIGN OF THE SECOND-GENERATION COMPRE-HENSIVE HELICOPTER ANALYSIS SYSTEM Final Report Oct 1978 162 p refs

(Contract DAAJ02-77-C-0058 DA Proj 1L2-63211-D-157) (AD-A064131 USARTL-TR-78-43) Avail NTIS

HC A08/MF A01 CSCL 01/3

This report summarizes the efforts and results of the predesign of the Second-Generation Comprehensive Helicopter Analysis System (also referred to as the System) Attention is focused on the solution to problems that are inherent in the design development maintenance validation and use of a system that satisfies the objectives and requirements set forth in the Statement of Work. The objectives and design considerations are presented along with a comprehensive design that will enable the realization of all objectives through the use of dynamic component coupling techniques a comprehensive but simple user-oriented control language and an extensive library of technical modules System usage has been described in three levels Intermediate and Advanced Suggested responsibilities and relationships of the various agencies during the Development Phase are presented also development schedules documentation and testing requirements are included. The concept of a Baseline Review Board and its activities are offered to enhance quality assurance control Based on the results of the Predesign Phase the Second-Generation Comprehensive Helicopter Analysis System has been determined by Control Data Corporation and Kaman Aerospace Corporation to be a feasible system that will provide users with a viable vehicle for current and future endeavors in the prediction of performance stability and control acoustics loads and aeroelastic stability characteristics of rotorcraft

Author (GRA)

N79-22084# Science Applications Inc McLean Va PREDESIGN OF THE SECOND GENERATION COMPREHEN-SIVE HELICOPTER ANALYSIS SYSTEM Final Report, Sep 1977 - May 1978

T Hamrick D Copeland F Tarzanin J Staley L Hunt and G Burns Dec 1978 149 p refs (Contract DAAJO2-77-C-0059 DA Proj 1L2-63211-D-157) (AD-A064289 USARTL-TR-78-42) Avail NTIS HC A07/MF A01 CSCL 01/3

A predesign study was conducted for a proposed Second Generation Comprehensive Helicopter Analysis System (CHAS) A draft Type A system specification was reviewed to determine its validity for a system to analyze helicopter performance stability and control loads aeroelastic stability and acoustics using consistent technology with a capability for several levels of complexity

N79-22085# Boeing Vertol Co Philadelphia Pa
OH-58 COMPOSITE MAIN ROTOR BLADES PRELIMINARY
DESIGN INVESTIGATION Final Report
J S Hoffrichter Nov 1978 240 p refs

(Contract DAAJ02-77-C-0074 DA Proj 1L2-62209-AH-76)

(AD-A065010 USARTL-TR-78-27) Avail NTIS HC A11/MF A01 CSCL 01/3

This report presents the results of a design study to replace the existing OH-58 C/A Main Rotor Blade with a Composite Rotor Blade The effort consisted of a trade study phase and a preliminary design phase. The composite construction rotor blade defined in this report in whole or in part meets the defined improvement objectives in the areas of life cycle cost performance reliability and maintainability radar reflectivity and ballistic survivability.

N79-22086# Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering

PARAMETRIC ANALYSIS OF STEREOMETRIC TRACKER FOR USE IN TACTICAL AIRCRAFT M S Thesis

Kurt F Schroeder Oct 1978 115 p refs (AD-A064688 AFIT/GEP/PH/78D-11) HC A06/MF A01 CSCL 17/8

especially angular vibration data

Avail NTIS

Author (GRA)

The stereometric range finding technique is used as the basis of an airborne passive tracker. An analysis of the method reveals that angular accuracy is the most critical element in this technique. Range accuracy can be improved by increasing baseline separation. However, the vibration environment of the aircraft becomes worse as the baseline is increased. The results of this investigation indicate that these vibrations counter any gain in resolution. The investigation was hindered by a lack of vibrational data.

N79-22087*# Pennsylvania State Univ State College Applied Research Lab

THE EFFECTS OF DESIGN AND OPERATING VARIABLES ON THE RESPONSE OF AN AXIAL FLOW FAN TO INLET

FLOW DISTORTIONS MS Thesis

Adam M Yocum II 14 Jun 1978 228 p refs
(Grant NsG-3031 Contract N00017-73-C-1418)
(NASA-CR-158522 ARL/TM-78-178) Avail NTIS
HC A11/MF A01 CSCL 21E

The results of a study of total pressure and velocity circumferential distortions in an axial-flow fan are presented. Some of the fundamental experimental data needed to understand distorted flow phenomena as affected by design and operating variables are provided. The flow through an isolated rotor was examined at various operating conditions with six different distortions and three different blade stagger angles. Circumferential surveys were conducted upstream and downstream of the rotor using five-hole probes in the nonnulling mode. The total pressure and axial velocity distortion data were analyzed to determine the degree of distortion attenuation as a function of blade stagger angle mean incidence angle and reduced frequency. The results indicate that for the rotors tested the mean incidence or loading has very little effect on the distortion attenuation.

N79-22089# Von Karman Inst. for Fluid Dynamics. Rhode-Saint-Genese (Belgium)

THE FLOW THROUGH LOW CAMBERED TRANSONIC TURBINE CASCADE

C H Sieverding and R Sampson $In\ its$ VKI Short Course on Flow in Turbines Apr 1969 40 p refs

Avail NTIS HC A14/MF A01

The flow in low cambered transonic cascades with a well defined geometric throat can be reasonably well by theory. The flow properties in the throat region of cascades without defined geometric throats however must be determined by experimental investigations. When the cascade flow is known the losses can be calculated for the following idealized conditions (1) no shock-boundary layer interaction (2) no boundary layer separation near the trailing edge and (3) trailing edge of negligible thickness. A proper loss calculation including these effects does not yet seem to exist. Flow problems in transonic turbine blading are discussed for three blade configurations. The cascade flow is calculated in the subsonic flow field during the transition from subsonic to supersonic flow field and for the supersonic flow field downstream of the throat.

results are compared Reattachment and separation criteria are given as well as procedures for calculating the confluence of two supersonic jet boundaries behind the trailing edge of a blade

A R H

N79-22090# Von Karman Inst. for Fluid Dynamics. Rhode-Saint-Genese (Belgium)

INTRODUCTION TO COOLING OF GAS TURBINE BLADES

C Liess In its VKI Short Course on Flow in Turbines Apr 1969 105 p refs 13-07)

Avail NTIS HC A14/MF A01

The development of heat resistant alloys and the use of various methods for cooling turbine blades and vanes to improve the gain in turbine entry temperature are reviewed. The influence of turbine design and engine components on cooling problem is assessed and methods are given for calculating cooled blades. The thermal and aerodynamic losses resulting from blade cooling are discussed as well as fabrication costs for cooled blades. Requirements on a cooling system are described. The advantages and disadvantages of internal and external liquid or air cooling are examined as well as those for a combined internal and external air cooling system.

A R H

N79-22091# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

AERODYNAMIC PROBLEMS IN COOLED TURBINE BLADING DESIGN FOR SMALL GAS TURBINE

J Chauvin K Papailiou and L Burrows *In its* VKI Short Course on Flow in Turbines Apr 1969 32 p refs Presented at the 32d Meeting of AGARD Propulsion and Energetics Panel on Advanced Components for Turbojet Engines Toulouse 9-13 Sep 1968

Avail NTIS HC A14/MF A01

The next generation of small gas turbines (in the 500-1000 shp range) will have to use turbine inlet temperatures of the order of 1300 C if specific fuel consumption and specific power better than those of piston engines must be reached Such temperature can be realized only if cooling of the nozzle and blades of the compressor turbine is used. Air and liquid cooling are being considered. Strength and space requirement lead to the use of thick blades especially at the trailing edge and having a minimum chord length of several centimeters. The mass flow to handle leads to small passages height and therefore to ascpect ratios of the order of 0.4. High losses are generated due to blade profile trailing edge thickness and above all secondary losses. The VKI turbomachinery laboratory research in the field of blade optimization and in the analysis and reduction of secondary flows and losses is reviewed Author

N79-22092# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

AXIAL FLOW TURBINES

H Vavra In its VKI Short Course on Flow in Turbines Apr 1969 92 p refs

Avail NTIS HC A14/MF A01

Topics covered include fundamental flow relations (equations of motion energy and continuity) axisymmetric orthogonal coordinate systems three dimensional flows flow in turbine cascades geometry of blade profiles losses in turbine stages and off-design performance

A R H

N79-22093# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

CLOSED CYCLE GAS TURBINES

1970 347 p refs Lecture held at Rhode-Saint-Genese Belgium 11-15 May 1970

(VKI-Lecture-Series-24) Avail NTIS HC A15/MF A01

The requirements of closed cycle gas turbines are discussed as well as the thermophysical properties of various working fluids Methods for calculating thermodynamic efficiency and for component design are described

N79-22094# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

CLOSED POWER CYCLES' ANALYSIS

Gianfranco Angelino In its Closed Cycle Gas Turbines 1970 93 p refs

Avail NTIS HC A15/MF A01

The general configuration and basic requirements of closed power cycles are discussed with emphasis on the mean density of the working fluid Methods are given for computing the thermodynamic properties of various working fluids from their volumetric behavior as well as through the principle of corresponding states Topics covered include analysis of Rankine cycles entrophy analysis organic fluid Rankine cycles single phase gas cycles (both real and ideal) nonconventional closed power cycles and configurations and carbon dioxide nonconventional closed power cycles. Tables show the thermophysical properties of sodium potassium rubidium cesium mercury water carbon dioxide sulfur hexafluoride perfluoropropane dichlorodif-luoromethane perfluorocyclobutane and perfluorobenzene A R H

N79-22095# Technische Universitäet Hanover (West Germany) DYNAMIC BEHAVIOUR AND CONTROL OF SINGLE-SHAFT CLOSED-CYCLE GAS TURBINES

K Bammert and G Krey In Von Karman Inst for Fluid Dyn Closed Cycle Gas Turbines 1970 28 p refs

Avail NTIS HC A15/MF A01

Although a precise calculation of the dynamic behavior of a closed-cycle gas turbine involves great mathematical display sufficiently exact results can be achieved by reasonably simplifying the most difficult problems. Corresponding precalculations carried out on a digital computer quickly render possible the selection of the most suitable control principle the layout of the regulating apparatuses such as valves controllers and the starting motor. Such calculations also permit the optimization of the controller adjustment and the determination of stability limits of the control loop. The exact solution of these points is of importance not only in regard to an undisturbed operation of the power plant but also in view of safety particularly in the case of a nuclear helium turbine.

N79-22096# AIResearch Mfg Co Phoenix Ariz CLOSED BRAYTON CYCLE SYSTEM OPTIMIZATION FOR UNDERSEA, TERRESTRIAL, AND SPACE APPLICATIONS Edward A Mock /n Von Karman Inst for Fluid Dyn Closed Cycle Gas Turbines 1970 97 p refs

Avail NTIS HC A15/MF A01

Considerable flexibility is available when adapting the closed Brayton cycle to a particular application and this same flexibility is required in the analysis procedures. These procedures must accurately predict the system performance since critical design decisions are frequently based on the results. Accordingly the Brayton cycle system analysis procedures are discussed to show the basis and depth of the analysis. Detailed optimization studies of two cycles for the same undersea application are presented and the selection of the reference system discussed. Optimization study results of several other system applications and existing hardware descriptions are included. Of particular note are the results of the system studies directed toward defining the power system for the future NASA space station space base.

N79-22097*# National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

DESIGN PROBLEMS OF SMALL TURBOMACHINERY

H E Rohlik *In* Von Karman Inst for Fluid Dyn Closed Cycle Gas Turbines 1970 11 p refs

Avail NTIS HC A15/MF A01 CSCL 21E

Advanced design and testing techniques developed at NASA Lewis to achieve high efficiency in small turbomachines are described. Small radial and axial turbines and compressors were built for space power systems and associated studies at the Lewis Research Center. A six stage axial compressor of 3.5 inches diameter and axial turbines of 5 and 8.5 inches diameter were

included Radial turbines and compressors ranged from 3.5 to 6 inches Topics discussed include maximum efficiency as a function of speed the effect of compressibility on passage size the use of quasi-orthogonals to calculate cross-channel velocity gradients a design point velocity diagram study for axial turbines and estimating off-design performance. Special turbine instruments and calibration procedures were developed to test compressors and turbines, to determine Reynolds and size number effects clearance specific speed effects and compressor performance Laboratory tests conducted to study system operation and shaft and bearing motions are also reviewed.

N79-22098# Gutehoffnungshuette Sterkrade A G Oberhausen (West Germany)

CALCULATION AND DESIGN OF CLOSED CYCLE HELIUM TURBINES FOR HIGH TEMPERATURE REACTORS

W Twardziok In Von Karman Inst for Fluid Dyn Closed Cycle Gas Turbines 1970 10 p refs

Avail NTIS HC A15/MF A01

The coupling of closed cycle gas turbines with helium cooled high temperature reactors is discussed with emphasis on thermodynamics the layout of helium turbines for high output and general plant arrangement. Topics covered include cycle arrangements influence of gas properties calculating the overall circuit and the determination of mass flow conditions of state and internal efficiencies. From these parameters the turbines compressors and turbosets can be designed. Projected development activities include the construction of test rigs and a test program for hot-gas valves and insulations.

N79-22099*# National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

PERFORMANCE OF A VORTEX-CONTROLLED DIFFUSER IN AN ANNULAR SWIRL-CAN COMBUSTOR AT INLET MACH NUMBERS UP TO 0 53

John M Smith Washington Apr 1979 17 p refs (NASA-TP-1452 E-9832) Avail NTIS HC A02/MF A01 CSCL 21E

A short annular dump diffuser with suction stabilized vortices in the region of abrupt area change was tested with a full scale annular swirl can combustor. The prediffuser area ratio was 1.4 Performance data were obtained for both isothermal and burning conditions at inlet temperatures of 589 to 895 K and pressures of 0.5 to 1.0 MPa for a range of diffuser inlet. Mach numbers from 0.25 to 0.53. Suction rates were 0 to 2.0 percent of the total diffuser mass flow rate. Diffuser effectiveness increased from 4.7 percent without suction to approximately 8.0 percent for a total suction rate of 1.4 percent. Combustor total pressure loss for the same total suction rate was reduced from 6.8 percent without suction to 4.0 percent at inlet Mach number of 0.40.

N79-22100*# Flow Research Inc Kent Wash PROCEDURE FOR NOISE PREDICTION AND

PROCEDURE FOR NOISE PREDICTION AND OPTIMIZATION OF ADVANCED TECHNOLOGY PROPELLERS Final Report

Wen-Huei Jou and Samuel Bernstein Apr 1979 54 p refs (Contract NAS2-9807)

(NASA-CR-3080 Rept-119) Avail NTIS HC A04/MF A01 CSCL 01C

The sound field due to a propeller operating at supersonic tip speed in a uniform flow was investigated. Using the fact that the wave front in a uniform stream is a convected sphere the fundamental solution to the convected wave equation was easily obtained. The Fourier coefficients of the pressure signature were obtained by a far field approximation and are expressed as an integral over the blade platform. It is shown that cones of silence exist fore and aft the propeller plane. The semiapex angles are shown These angles are independent of the individual Mach components such as the flight Mach number and the rotation Mach number. The result is confirmed by the computation of the ray path of the emitted Mach waves. The Doppler amplification factor strengthens the signal behind the propeller while it weakens that upstream.

N79-22101*# National Aeronautics and Space Administration Langley Research Center Hampton Va

PERFORMANCE ESTIMATION FOR A HIGHLY LOADED EIGHT-BLADE PROPELLER COMBINED WITH AN ADVANCED TECHNOLOGY TURBOSHAFT ENGINE

Shelby J Morris Jr Apr 1979 49 p refs

(NASA-TM-80075) Avail NTIS HC A03/MF A01 CSCL 21A Performance estimation, weights and scaling laws for an eight-blade highly loaded propeller combined with an advanced turboshaft engine are presented. The data are useful for planned aircraft mission studies using the turboprop propulsion system. Comparisons are made between the performance of the 1990+technology turboprop propulsion system and the performance of both a current technology turbofan and an 1990+technology

N79-22102# Pratt and Whitney Aircraft Group West Palm Beach Fla Government Products Div

DESIGN, FABRICATION, AND EVALUATION OF GATOR-IZED (TRADE NAME) CERAMIC-WROUGHT ALLOY ATTACHMENT CONCEPTS Final Report, 1 Jul 1974 - 31 Jul 1978

S A McLeod and B H Walker Jan 1979 118 p refs (Contract N00019-74-C-0484)

(AD-A064597 FR-9787) Avail NTIS HC A06/MF A01 CSCL 21/5

The attachment of hot pressed silicon nitride material (HPSN) ceramic blades to a wrought superalloy disk utilizing the GATORIZING forging process was developed and demonstrated for application in small gas turbine engines. The development of this hybrid attachment concept consisted of fabricating, optimizing and evaluating single ceramic blade/wrought alloy attachments by spin testing at ambient and elevated temperatures. The hybrid rotor concept was demonstrated by designing fabricating, and spin testing several fully-bladed hybrid rotors some containing ceramic simulated pseudoblades and others containing airfoil blades. The spin testing was conducted at speeds and temperatures comparable to small gas turbine engines.

Author (GRA)

N79-22103# United Technologies Research Center, East Hartford Conn

NONLINEAR STOCHASTIC CONTROL DESIGN FOR GAS TURBINE ENGINES Final Technical Report, 1 Apr 1976 - 31 Mar 1978

Florence A Farrar and Gerald J Michael Jun 1978 54 p refs

(Contract N00014-76-C-0710 RR0141184)

(AD-A065075 UTRC/R78-942577-13 ONR-CR-215-247-2F) Avail NTIS HC A04/MF A01 CSCL 21/5

Synthesis procedures for nonlinear stochastic feedback control of gas turbine engines were developed and evaluated. Modern estimation and control procedures based upon separating the stochastic and deterministic aspects of the control problem were employed. The resulting closed-loop control consists of nonlinear deterministic feedback control logic designed using piecewise-linear/piecewise-optimal techniques, and an estimator designed using nonlinear filtering logic. Engine variables estimated from noise-corrupted measurements are fed back through the deterministic control logic to generate commanded inputs to the engine. Mode-switching logic was developed to provide smooth transition between small-signal regulation and large-signal transient modes of estimator/controller operation.

N79-22104# Pratt and Whitney Aircraft Group West Palm Beach Fla Government Products Div

LO-FREQUENCY AUGMENTOR INSTABILITY STUDY Final Report, 1 Mar 1976 - 30 Jul 1978

P Z Russell and G Brant 15 Dec 1978 230 p refs (Contract F33615-76-C-2024)

(AD-A065144, PWA-FR-10397 AFAPL-TR-78-82) Avail NTIS HC A11/MF A01 CSCL 21/5

With the advent of the mixed-flow afterburner in turbofan engines a type of low-frequency instability known as rumble

became a serious problem. Rumble occurs mainly at high fuel-air ratios and at flight Mach numbers and altitudes where low duct inlet air temperatures and pressures exist. Cut and try methods of solution during engine development have been partially successful but very expensive. To aid the development engineer in designing rumble-free afterburners an analytical model has been formed. The model was evolved in conjunction with and checked by two experimental programs. Rumble mechanisms investigated early in this study involved system airflow dynamics combustion efficiency oscillations, fuel vaporization and recirculation wake energy. The model was then refined and extended to include the mixed flow experienced in a turbofan augmentor Predictions were made for the effects of altitude fan stream fuel-air ratio, fan stream temperature core stream fuel-air ratio and fan duct pressure loss. The major conclusion from the modeling effort was that the efficiency falloff in the fan stream at high fuel-air ratio causes rumble. This was verified with engine altitude tests at NASA Lewis Research Center with several augmentor configurations. These tests included heat addition to the fan stream fuel-air distribution changes and spraybar to flameholder length variation. The basic formulation of the model, the mixed flow augmentor model predictions and the experimental programs are discussed Author (GRA)

N79-22105# General Electric Co Cincinnati Ohio Aircraft Engine Group

ADVANCED COMPOSITE ENGINE ROTOR DESIGN Final Technical Report, Oct 1977 - Mar 1978

Richard Ravenhall, Robert Strabrylla, and Lewis Stoffer Oct 1978 117 p

(Contract F33615-77-C-5201)

(AD-A063843, R78AEG333 AFML-TR-78-134) Avail NTIS HC A06/MF A01 CSCL 21/5

This report describes the results of an advanced compositerotor mechanical-design-feasibility study program. Four advanced
composite fan-rotor concepts and one composite reinforced
compressor-rotor concept were evolved and evaluated during this
study. One particular fan concept titled pinned-blade/hoop rotor
received extended evaluation because it allowed the replacement of blades and showed a significant weight and cost
advantage over the metal counterpart. This concept was applied
to both a subsonic-flight engine and a supersonic-flight engine
for potential future development.

Author (GRA)

N79-22106# General Electric Co Cincinnati Ohio Aircraft Engine Group

REGRESSION SIMULATION OF TURBINE ENGINE PERFORMANCE/AIRCRAFT REGRESSION MODEL Final Technical Report, Sep. 1977 - Jul. 1978

Warren Joy and Donald E Uehling Nov 1978 76 p refs (Contract F33615-77-C-2108 AF Proj 3066)

(AD-A063975, R78AEG445 AFAPL-TR-78-76) Avail NTIS HC A05/MF A01 CSCL 21/5

The Aircraft Regression Model (ARM) Task has explored modification of the Boeing Turbine Engine Variable Cycle Selection/Airplane Response Engine Selection(TEVCS/A RES) procedures by decoupling the representation of specific propulsion systems and the detailed mission definitions from the overall surface fit representations of the aircraft Detailed comparisons between the RSTEP/ARM techniques developed herein and another available technique for aircraft/engine design refinement are provided as the principal result of this program All objectives of the RSTEP/ARM effort were attained A simplified mission performance computer program was developed and tested in the evaluation of two engine cycle concepts one a turbojet and one a turbofan The program was simplified by using regression models for airframe geometry weights and drags The program is currently operational in both the Air Force and at two industry sites

N79-22107# AIResearch Mfg Co Phoenix Ariz RESEARCH AND EVALUATION PROGRAM ON A BACKUP CONTROL SYSTEM FOR GAS TURBINE ENGINES Final Report, Oct 1977 - Aug 1978

Trevor G Sutton Sep 1978 38 p refs (Contract DAAG39-77-C-0186)

(AD-A064326 AiResearch-41-2111 HDL-CR-78-186-1) Avail NTIS HC A03/MF A01 CSCL 21/5

This report presents the results of a program conducted by AiResearch and funded by Harry Diamond Laboratories to investigate backup control systems for gas turbine engines which could be used in military ground vehicles. The program addressed the control system requirements that are deemed necessary to provide a military gas turbine powered vehicle with battlefield survivability and minimal restriction on the capability of completing the vehicle mission. This study showed that a parallel dissimilar technology backup control was the desirable approach and that fluidics was the ideal technology to perform this function due to its low cost realiability immunity to radiation and ability to perform computation and logic commensurate with the requirements of achieving mission completion with no degradation in the vehicle's battlefield survivability.

N79-22108# Panametrics Inc Waltham Mass ADVANCED TECHNOLOGY FUEL MASS FLOWMETER Final Report, Jun 1977 - Jun 1978

Lawrence C Lynnworth Norman E Pedersen, John L Seger and James E Bradshaw Oct 1978 53 p refs (Contract DAAJ02-76-C-0030)

(AD-A063963 USARTL-TR-78-45 Rept-138) Avail NTIS HC A04/MF A01 CSCL 21/4

The fuel mass flowmeter system demonstrated in a previous Army program consisting of an ultrasonic flow velocimeter and a capacitance-type densitometer was adapted to T-700 gas turbine engine requirements. Mechanical adaptations included the reduction in size and weight of the flow cell to fit the configuration and mounting constraints of a T-700 engine. Electronic developments included repackaging into a portable field-type case configuration switching and digital delay equalizers and the substitution of a microprocessor for a previously used calculator chip resulting in a choice of response times or integration times selectable from approximately 50s down to approximately 0.5s.

N79-22109*# Scott Environmental Technology Inc Plumstead -

F-100 TURBINE ENGINE AFTERBURNER EMISSION TESTS

Final Report, Nov 1976 - Dec 1977
Anthony F Sousa and Harold A Scott Jr Sep 1978 90 p
refs

(Contract F08635-77-C-0216 AF Proj 2103)

(AD-A063789 SET-1628-01-1177 CEEDO-TR-78-54) Avail NTIS HC A05/MF A01 CSCL 21/2

The afterburner exhaust emissions from three F-100-P-100 engines were measured Emission rates of hydrocarbons carbon monoxide and oxides of nitrogen were calculated Smoke numbers were also measured

Author (GRA)

N79-22110# Teledyne Ryan Aeronautical Co San Diego Calif RPV ELECTRIC POWER SYSTEM STUDY PHASE 2 HOT BENCH MOCKUP DEVELOPMENT Final Technical Report, 1 May 1978 - 31 Aug 1978

Frederic L Miller and Lou Pico Nov 1978 100 p (Contract F33615-76-C-2069 AF Proj 3145) (AD-A065008 TRA-29318-08 AFAPL-TR-78-93) Avail NTIS HC A05/MF A01 CSCL 01/3

The RPV Electric Power Study explores ways for exploiting technology and resolving critical issues affecting the electrical subsystems of remotely piloted vehicles. The objective is to define electrical components and system concepts that offer significant cost weight and performance improvements over present day systems. Phase I is an assessment of technologies capable of benefitting RPV electrical systems. Phase II develops a plan to transfer viable technologies into RPV systems. The Phase II approach is to first develop a complete picture of the needs requirements and constraints on a laboratory hot bench mockup After considering concept alternatives and related design factors a modular concept is selected that is adaptable to all classes of RPV Preliminary designs of a mockup for each of the four classes of RPV are described that is Advanced multi-mission RPV High-altitude long endurance RPV Mini RPV and Tactical expendable drone system (TEDS). A mockup development plan

is presented for each RPV class including a schedule budgetary estimate of labor and material costs list of components and a list of manufacturers capable of developing those items requiring development. Also included is a guide for developing test programs for RPV electrical systems Author (GRA)

N79-22111# National Technical Information Service Springfield

TURBINE BLADES EROSION AND CORROSION CITATIONS FROM THE NTIS DATA BASE Progress Report. 1964 - Feb 1979

Guy E Habercom Jr Mar 1979 171 p Supersedes NTIS/PS-78/0144 NTIS/PS-77/0086 NTIS/PS-76/0081 NTIS/PS-75/127

(NTIS/PS-79/0148/1 NTIS/PS-78/0144 NTIS/PS-77/0086 NTIS/PS-75/127) NTIS/PS-76/0081 Avail HC \$28 00/MF \$28 00 CSCL 21E

These Government-sponsored research reports describe sources of erosion/corrosion of turbine blades and suggest methods to eliminate or alleviate the problems. This updated bibliography contains 165 abstracts 26 of which are new entries to the previous edition

N79-22112# National Technical Information Service Springfield

TURBINE BLADES EROSION AND CORROSION CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Feb 1979

Guy E Habercom Jr Mar 1979 201 p Supersedes NTIS/PS-78/0145 NTIS/PS-77/0087 NTIS/PS-76/0082 (NTIS/PS-79/0149/9 NTIS/PS-78/0145 NTIS/PS-77/0087 NTIS/PS-76/0082) Avail NTIS HC \$28 00/MF \$28 00 CSCL

These reports gathered in a worldwide literature survey describe sources of erosion/corrosion of turbine blades and suggest methods to eliminate or alleviate the problems. This updated bibliography contains 195 abstracts 36 of which are new entries to the previous edition

N79-22113*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif IMPORTANT FACTORS IN THE MAXIMUM LIKELIHOOD ANALYSIS OF FLIGHT TEST MANEUVERS

Kenneth W Iliff Richard E Maine and T D Montgomery Apr 1979 44 p refs

(NASA-TP-1459 H-1076) Avail NTIS HC A03/MF A01 CSCL

The information presented is based on the experience in the past 12 years at the NASA Dryden Flight Research Center of estimating stability and control derivatives from over 3500 maneuvers from 32 aircraft. The overall approach to the analysis of dynamic flight test data is outlined. General requirements for data and instrumentation are discussed and several examples of the types of problems that may be encountered are presented SES

N79-22114# Bendix Corp Teterboro N J Flight Systems

ADVANCED FLIGHT CONTROL ACTUATION SYSTEM (AFCAS-E/P) FEASIBILITY INVESTIGATION OF AN ELECTRO/PNEUMATIC DUAL POWER DRIVEN CONCEPT Final Report, Mar 1977 - May 1978
R E Feucht Rex W Presley Philip Forman and Richard Krehely

Jun 1978 121 p

(Contract N62269-77-C-0171)

(AD-A063992 FSD-7411-78 05 NAD C-77001-60) Avail NTIS HC A06/MF A01 CSCL 01/3

This is a report of design study on Dual-Mode Dynavector Actuator for use as control-surface actuator on aircraft. Actuator operates on pneumatic power and /or electric power Operation within specifications continues despite loss of either electric or pneumatic power providing survivability feature for aircraft

Author (GRA)

N79-22115# Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering

APPLICATION OF MODEL ALGORITHMIC CONTROL TO A LIGHTLY DAMPED SINGLE INPUT SINGLE OUTPUT SYSTEM MS Thesis

Howard J Colson Jr Dec 1978 112 p refs (AD-A064222 AFIT/GE/EE/78-21) NTIS HC A06/MF A01 CSCL 01/3

A new digital control technique called Model Algorithmic Control (MAC) was applied to a single-input single-output model containing complex eigenvalues. The MAC algorithm developed was a simplified version of the algorithm used by ADERSA/ GERBIOS Corporation (France) in a complete computer program designated IDCOM (Identification and Command). A second-order model based on the dominant eigenvalues of the B-52E Flutter Mode was selected as the hypothetical system to be controlled Data were obtained for various selections of control parameters in the implementing program, then a study was made of the controlling program's robustness to eigenvalue changes. The second-order model was subsequently expanded to a third-order then a fourth-order model while maintaining the previously found optimum control parameters Results obtained indicated that the robustness exhibited in the MAC concept as implemented in IDCOM is not attributed to the impulse response prediction technique but rather must be attributed to the particular control algorithm used in IDCOM Therefore before conclusive results could be obtained for robustness and higher-order model studies further refinement of the simplified MAC algorithm used in this thesis was necessary. A revision to the implementing program was begun but due to time considerations was not Author (GRA) completed

N79-22116# National Aviation Facilities Experimental Center Atlantic City N J

EVALUATION OF A REMOTE TONE SIGNALING CONTROL/ MONITOR SYSTEM AS LIGHTNING/TRANSIENT PROTEC-TION FOR SOLID STATE INSTRUMENT LANDING SYSTEMS Final Report, Aug 1976 - Apr 1978

James R Branstetter Jan 1979 21 p refs (FAA Proj 071-713-000)

(AD-A063766 FAA-NA-78-35 FAA-RD-78-149) Avail NTIS HC A02/MF A01 CSCL 17/7

A new technique in remote control and monitoring of a solid-state instrument landing system was evaluated at the National Aviation Facilities Experimental Center intended as a solution to problems caused by lightning and transients on phone lines and buried cables. The findings show the system effectively reduces or eliminates false transmitter cycling erroneous status indications and damage to the ILS equipment Author

N79-22117# ARO Inc Arnold Air Force Station Tenn CALIBRATION OF THE AEDC-PWT 16-FOOT TRANSONIC TUNNEL AERODYNAMIC TEST SECTION AT VARIOUS REYNOLDS NUMBERS Final Report, Apr 1976 - Jun 1978

F M Jackson III Feb 1979 179 p refs (AD-A065112 AEDC-TR-78-60) NTIS Avail HC A09/MF A01

Tests were conducted in the AEDC Propulsion Wind Tunnel (16T) to determine the tunnel test section Mach number distributions and calibration at various Reynolds numbers. Two separate test entries were made. Collectively, the calibration was conducted at Mach numbers from 02 to 16 and at Reynolds numbers from 500 000/ft to 6 million/ft. The calibration was conducted with the aerodynamic test section (Test Section 2) using a centerline pipe and/or wall pressure orifices to define the Mach number distributions. A quantitative evaluation of the effects of tunnel pressure ratio, test section wall angle and Reynolds number on the tunnel Mach number distributions and calibration was accomplished. Results indicate that good quality Mach number distributions are obtained for both zero and the optimum wall angle schedule. To obtain the maximum accuracy the Tunnel 16T calibration must be defined as a function of test section wall angle Reynolds number and Mach number Comparison of this calibration with previous calibration results indicates that a revision in the tunnel calibration used for operations is desirable. Analytical expressions which represent the tunnel calibration at various test conditions were developed for use during Tunnel 16T operations GRA

N79-22118# Air Force Human Resources Lab Brooks AFB

ADVANCED SIMULATOR FOR PILOT TRAINING (ASPT) AERIAL REFUELING VISUAL SIMULATION-ENGINEERING Final Report, Sep. 1977 - Feb. 1978

Eric G Monroe Kent I Mehrer Richard L Engel Samuel Hannan James McHugh George Turnage and David R Lee Sep 1978 43 p

(AF Proj 1123)

(AD-A063283 AFHRL-TR-78-51) Avail NTIS HC A03/MF A01 CSCL 05/9

This report documents the engineering modifications made to the Advanced Simulator for Pilot Training (ASPT) to expand its capability to include aerial refueling simulation. These modifications include the generation of a number of KC-135 tanker models (in various levels of image detail) refueling boom and director lights. The existing variable/slewable field-of-view program was modified to generate multiple window configurations. The on-line programs were amended to provide boom dynamics operational director lights, and tanker flow field effects. Performance measurement techniques and a dynamic graphics display were programmed to provide an adequate means of assessing and monitoring pilot performance.

N79-22119# Logicon Inc San Diego Calif

DEFINITION OF REQUIREMENTS FOR A PERFORMANCE MEASUREMENT SYSTEM FOR C-5 AIRCREW MEMBERS Final Report, Jun 1976 - Mar 1978

Jay R Swink Edward A Butler Harry E Lankford Ralph M Miller and Hal Watkins Oct 1978 76 p (Contract F33615-76-C-0056)

(AD-A063282, AFHRL-TR-78-54) Avail NTIS

HC A05/MF A01 CSCL 05/9

This study identified and defined C-5 aircrew tasks and performances essential to the effective operation of the aircraft on a typical representative mission. It described present capabilities of C-5 simulators to determine how these capabilities might be implemented or augmented for measuring crew performance. The results of the above efforts were synthesized into a description of the requirements for a C-5 aircrew performance measurement subsystem. The study also identified the applicability of these C-5 simulator performance measures to the airborne environment. The capabilities of the C-5 aircraft systems to provide necessary data are described and the results are synthesized into a functional description for a C-5 inflight performance measurement system.

N79-22120# General Accounting Office Washington D C Logistics and Communications Div

DOD'S COMMENDABLE INITIAL EFFORTS TO SOLVE LAND USE PROBLEMS AROUND AIRFIELDS

Jan 1979 36 p

(PB-291617/9 LCD-78-341) Avail NTIS HC A03/MF A01 CSCL 13B

A program for achieving compatible land uses around military airfields is reviewed. It is suggested that the airfield studies where operational changes have occurred be revised to identify more accurate and current noise zones.

N79-22199*# National Aeronautics and Space Administration Langley Research Center Hampton Va

CARBON FIBERS AND COMPOSITES

Richard A Pride In its Carbon Fiber Risk Anal 1979 p 29-40

Avail NTIS HC A11/MF A01 CSCL 11D

The basic nature of composite materials is considered. Carbon fiber composites and their area of current and planned application in civil aircraft are discussed specifically within the framework of the various aspects of risk analysis.

N79-22200*# National Aeronautics and Space Administration Langley Research Center Hampton, Va

SOURCE OF RELEASED CARBON FIBERS

Vernon L Bell In its_Carbon Fiber Risk Anal 1979 p 41-71 Avail NTIS HC A11/MF A01 CSCL 11D

The potential for the release of carbon fibers from aircraft crashes/fires is addressed. Simulation of the conditions of aircraft crash fires in order to predict the quantities and forms of fibrous materials which might be released from civilian aircraft crashes/ fires is considered. Figures are presented which describe some typical fiber release test activities together with some very preliminary results of those activities. The state of the art of carbon fiber release is summarized as well as some of the uncertainties concerning accidental fiber release.

N79-22204*# National Aeronautics and Space Administration Langley Research Center Hampton Va END-TO-END TESTING

Richard A Pride In its Carbon Fiber Risk Anal 1979 p 125-139

Avail NTIS HC A11/MF A01 CSCL 11D

The principle objective of the kinds of demonstration tests that are discussed is to try to verify whether or not carbon fibers that are released by burning composite parts in an aircraft-fuel fires can produce failures in electrical equipment A secondary objective discussed is to experimentally validate the analytical models for some of the key elements in the risk analysis. The approach to this demonstration testing is twofold limited end-to-end test are to be conducted in a shock tube and planning for some large outdoor burn tests is being done.

N79-22207*# ORI Inc Silver Spring Md AN ASSESSMENT OF LOCAL RISK

Leon Pocinki In NASA Langley Res Center Carbon Fiber Risk Anal 1979 p 173-198

Avail NTIS HC A11/MF A01 CSCL 11D

A status report is presented on the assessment of the risk at Washington National Airport and the surrounding Washington D C area associated with commercial operations of aircraft with graphite fiber composite in their structures. The presentation is outlined as follows. (1) overall strategy. (2) need for individual airport results. (3) airport-metro area model - submodels method assumptions and data and (4) preliminary results for National Airport - D C area.

N79-22208*# Little (Arthur D) Inc Washington D C AN ASSESSMENT OF NATIONAL RISK GENERAL CONCEPTS AND OVERALL APPROACH

Ashok Kalelkar *In* NASA Langley Res Center Carbon Fiber Risk Anal 1979 p 199-234

Avail NTIS HC A11/MF A01 CSCL 11D

The analysis of risk presented by carbon fiber utilization in commercial aviation is reported. The discussion is presented in three parts. (1) general concepts. (2) overall approach and (3) risk evaluation and perspective.

N79-22209*# National Aeronautics and Space Administration Langley Research Center Hampton Va

CARBON FIBER RISK ANALYSIS CONCLUSIONS

Robert J Huston In its Carbon Fiber Risk Anal 1979 p 235-248

Avail NTIS HC A11/MF A01 CSCL 11D

It was concluded that preliminary estimates indicate that the public risk due to accidental release of carbon fiber from air transport aircraft is small. It was also concluded that further work is required to increase confidence in these estimates. G.Y.

N79-22215# Rockwell international Corp Columbus, Ohio Aircraft Div

EVALUATION OF COMPOSITE WING FOR XFV-12A AIRPLANE, APPENDIX C Final Report, Aug - Sep 1978 13 Oct 1978 65 p

(Contract N62269-74-C-0577)

(AD-A063848 NADC-77183-30-APP-C) Avail NTIS HC A04/MF A01 CSCL 11/4

This Appendix prepared as a supplement to final report NADC-77183-30 dated December 1976 presents results of static and fatigue tests of a graphite/epoxy wing box structure designed and fabricated by the Columbus Aircraft Division (CAD) of Rockwell International Corporation under contract N62269-74-C-0577 These tests were conducted by the Navy at the Naval Air Development Center Warminster Pa during the period August-September 1978 Static loads to 150% of design limit load for the critical carrier based landing condition were applied to the composite wing box structure followed by a two lifetime fatigue spectrum loading with no evidence of structural damage or deformation. Descriptions of the test setup, applied loadings strain gage data deflection transducer data and comparisons of predicted vs recorded strain and deflection measurements are presented Author (GRA)

N79-22490# Borg-Warner Corp , Des Plaines III SAMPLE CALCULATION 4 PHI = 9 DEG 57

S Gopalakrishnan In Von Karman Inst for Fluid Dyn Transonic Flows in Turbomachinery Vol 2 1973 2 p

Avail NTIS HC A09/MF A01

The performance of the cascade at supersonic transonic and supersonic inlet Mach numbers was studied. An inlet tangential velocity upstream tangential velocity and flow angle and a backpressure were obtained SES

N79-22508# Creare Inc Hanover N H THE FLUID DYNAMIC DESIGN OF ADVANCED CENTRIF-**UGAL COMPRESSORS**

Robert C Dean Jr In Von Karman Inst for Fluid Dyn Advanced Radial Compressors 1974 99 p refs

Avail NTIS HC A05/MF A01

The flow models and aerodynamic design systems developed for the centrifugal compressor are described. Some evidence of the success and failings of this approach is given Important unresolved fluid dynamic problems now barring access to ultimate centifugal compressor performance are defined Author

N79-22518*# National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

OPERATING CHARACTERISTICS LEVER-MOUNTED RESILIENT-PAD GAS-LUBRICATED THRUST BEARING

Zolton N Nemeth Washington Apr 1979 30 p refs (NASA-TP-1438 E-9815) Avail NTIS HC A03/MF A01 CSCL 131

A resilient-pad gas thrust bearing consisting of pads mounted on cantilever beams was tested to determine its operating characteristic. The bearing was run at a thrust load of 74 newtons to a speed of 17000 rpm. The pad film thickness and bearing friction torque were measured and compared with theory. The measured film thickness was less than that predicted by theory The bearing friction torque was greater than that predicted by theory

N79-22522# Sikorsky Aircraft Stratford Conn ADVANCED COUPLING DEVELOPMENT PROGRAM Final Report, 15 Jun 1974 - 30 Oct 1977

Robert A Stone Oct 1978 138 p

(Contract DAAJ02-74-C-0054)

(AD-A064296, SER-510004, USARTL-TR-78-40) Avail NTIS HC A07/MF A01 CSCL 01/3

This report documents a four-phase effort in the development of an advanced technology coupling. A coupling survey(design and operational requirements definition, conceptual and detail design, fabrication static testing and dynamic testing) was conducted Two concepts out of seven developed in the program were chosen for fabrication and testing. One coupling a composite flexure element design, successfully completed a basic dynamic performance test and demonstrated superior operational capability to a stainless steel counterpart Author (GRA)

N79-22523# SKF Industries, Inc. King of Prussia Pa USER'S MÄNUAL FOR STEADY STATE AND TRANSIENT THERMAL ANALYSIS OF A SHAFT-BEARING SYSTEM (SHABERTH) Final Report, Sep. 1977 - Apr. 1978

William J Crecelius Nov 1978 174 p

(Contract DAAD05-74-C-0747)

(AD-A064150, AD-E430167, ARBRL-CR-00386) Avail NTIS HC A08/MF A01 CSCL 09/2

Predicting the performance of helicopter engine and transmission bearings following loss of normal circulating lubrication is an important part of an aircraft vulnerability estimate. The program SHABERTH was developed to provide the means of estimating the mechanical and thermal state of critical components within a shaft-bearing-housing drive system, first in the normal service (steady state) lubricated condition and second in the oil-starved (transient) condition. The program is installed on the BRL Univac 1108 system and is used primarily to predict time-tofailure and failure mode after oil starvation, however, it will at the same time predict thermal dams, critical clearances and other significant behavioral features of the system under treatment, for both normal and dry operation. The program is being used for problems concerning domestic developmental aircraft and non-domestic aircraft for which no physical test data or hardware are available Author (GRA)

N79-22540*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex

HYDRAZINE MONOPROPELLANT RECIPROCATING ENGINE DEVELOPMENT

James W Akkerman In its The 13th Aerospace Mech Symp 1979 p 1-14

Avail NTIS HC A13/MF A01 CSCL 21G

A hydrazine fueled piston engine for providing 112 kW was developed to satisfy the need for an efficient power supply in the range from 3.7 to 74.6 kW where existing nonair-breathing power supplies such as fuel cells or turbines are inappropriate The engine was developed for an aircraft to fly to 213 km and above and cruise for extended periods. A remotely piloted aircraft and the associated flight control techniques for this application were designed. The engine is geared down internally (2.1) to accommodate a 1 8 m diameter propeller. An alternator is included to provide electrical power. The pusher-type engine is mounted onto the aft closure of the fuel tank, which also provides mounting for all other propulsion equipment. About 20 hrs of run time demonstrated good efficiency and adequate life. One flight test to 6.1 km was made using the engine with a small fixed-pitch four-bladed propeller. The test was successful in demonstrating operational characteristics and future potential

N79-22541*# Sikorsky Aircraft, Stratford Conn DESIGN AND DEVELOPMENT OF A MOTION COMPENSA-TOR FOR THE RSRA MAIN ROTOR CONTROL

P Jeffrey and R Huber In NASA Johnson Space Center The 13th Aerospace Mech Symp 1979 p 15-25 refs

Avail NTIS HC A13/MF A01 CSCL 01C

The RSRA an experimental helicopter is equipped with an active isolation system that allows the transmission to move relative to the fuselage. The purpose of the motion compensator is to prevent these motions from introducing unwanted signals to the main rotor control A motion compensator concept was developed that has six-degree-of-freedom capability. The mechanism was implemented on RSRA and its performance verified by ground and flight tests JMS

N79-22637# Chrysler Corp., New Orleans La Defense-Space

DEVELOPMENT OF A NICAD BATTERY INTERFACE UNIT Final Report, Jul 1976 - May 1978 Earnest Stephens Dec 1978 75 p

(Contract DAAJ02-76-C-0054)

(AD-A064290 USARTL-TR-78-47)

HC A04/MF A01 CSCL 10/3

NTIS

This report describes the effort to develop and test a Battery Interface Unit (BIU) for use on Army aircraft. The BIU provides a means to charge and monitor the status of nickel-cadmium batteries and is an onboard unit that can be readily integrated with the existing aircraft electrical system. The initial portion of the multitask program involved definition of candidate approaches analysis to select the optimum approach, and design of a system to implement the multilevel constant current approach selected as optimum. Six BIU's were then fabricated, three to operate with an AC input and three to operate from a DC input, they were subjected to a variety of performance and environmental tests to demonstrate performance. The objectives of the program were to develop a system that would reduce battery maintenance cost increase the useful life of NICAD batteries and eliminate battery-related safety hazards. The results of the program clearly demonstrated that a BIU can be built which meets these objectives and which can be packaged within weight and volume limits compatible with onboard aircraft usage Author (GRA)

N79-22706* # Dayton Univ Research Inst Ohio

FROST FORMATION ON AN AIRFOIL A MATHEMATICAL **MODEL 1** Final Report

Mark Dietenberger (Dayton Univ Research Inst Ohio) Prem Kumar (Dayton Univ Research Inst Ohio) and James Luers (Dayton Univ Research Inst Ohio) Apr 1979 80 p refs (Contract NAS8-31294)

(NASA-CR-3129 UDR-TR-78-123) NTIS Avail HC A05/MF A01 CSCL 04B

A computer model to predict the frost formation process on a flat plate was developed for application to most environmental conditions under which frost occurs. The model was analytically based on a generalized frost thermal conductivity expression on frost density and thickness rate equations and on modified heat and mass transfer coefficients designed to fit the available experimental data. The broad experimental ranges reflected by the extremes in ambient humidities wall temperatures and convective flow properties in the various publications which were examined served to severely test the flexibility of the model An efficient numerical integration scheme was developed to solve for the frost surface temperature density and thickness under the changing environmental conditions. The comparison of results with experimental data was very encouraging Author

N79-22783*# National Aeronautics and Space Administration Langley Research Center Hampton Va

EVALUATION APPLIED TO RELIABILITY ANALYSIS OF RECONFIGURABLE, HIGHLY RELIABLE, FAULT-TOLERANT, COMPUTING SYSTEMS

Gerard E Migneault Apr 1979 13 p refs (NASA-TM-80090) Avail NTIS HC A02/MF A01 CSCL 09B

Emulation techniques are proposed as a solution to a difficulty arising in the analysis of the reliability of highly reliable computer systems for future commercial aircraft. The difficulty viz the lack of credible precision in reliability estimates obtained by analytical modeling techniques are established. The difficulty is shown to be an unavoidable consequence of (1) a high reliability requirement so demanding as to make system evaluation by use testing infeasible (2) a complex system design technique fault tolerance (3) system reliability dominated by errors due to flaws in the system definition, and (4) elaborate analytical modeling techniques whose precision outputs are quite sensitive to errors of approximation in their input data. The technique of emulation is described indicating how its input is a simple description of the logical structure of a system and its output is the consequent behavior. The use of emulation techniques is discussed for pseudo-testing systems to evaluate bounds on the parameter values needed for the analytical techniques SES

N79-22849* # National Aeronautics and Space Administration Langley Research Center Hampton Va

A CORRELATION OF MIXING NOISE FROM COANNULAR JETS WITH INVERTED FLOW PROFILES

S Paul Pao Apr 1979 127 p refs (NASA-TP-1301 L-12155) Avail NTIS HC A07/MF A01 CSCL 20A

Data are correlated for jet mixing noise from coannular jets with inverted flow velocity profiles. The acoustic performance of coannular jets is compared to the performance of a hypothetical single jet with the same total mass flow thrust and total enthalpy flow as the coannular jet. The study shows that coannular jets with velocity ratios greater than 1.2 produce less noise than their corresponding equivalent tests and that optimum noise reduction of coannular jets in the data set occurs within a range of equivalent velocities between 500 and 700 meters per second and velocity ratios between 16 and 23 The maximum sound power reduction is found to be about 4 decibels. Directivity indices and a special set of spectral curves were developed to describe the characteristic double peak spectra of coannular jet noise. The temperature ratio between the inner and outer streams. was not found to be important in this acoustic correlation However the mean temperature effect was included in the computations of sound pressure levels

N79-22851# Federal Aviation Administration Washington D Office of Environmental Quality

INTEGRATED NOISE MODEL

Apr 1978 16 p Original contains color illustrations Avail NTIS HC A02/MF A01

A valuable noise-simulation computer-based tool for describing and defining the impact of aircraft noise around an airport is described. The integrated noise model (INM), which is useful in assessing actual or predicted airport noise impacts, takes into account all pertinent impact parameters including types and numbers of aircraft operating at the airport flight tracks operating procedures and time of day of aircraft operations. The capabilities and characteristics of the INM are discussed in order to provide a better understanding of aircraft noise the need for the INM and its potential applications

N79-22854# Lockheed-Georgia Co Marietta

THE GENERATION, RADIATION AND PREDICTION OF SUPERSONIC JET NOISE VOLUME 2, APPENDIX COMPUTER PROGRAM LISTING Final Technical Report, 1 Dec 1975 - 1 Sep 1978

B J Tester P J Morris H K Tanna and D F Blakney Oct 1978 134 p refs

(Contract F33615-76-C-2021)

(AD-A064685 LG78ER0262-Vol-2 AFAPL-TR-78-85-Vol-2) Avail NTIS HC A07/MF A01 CSCL 20/1

This appendix volume presents a complete listing of the unified jet noise prediction computer program (UNIJET) developed to predict the total noise from a subsonic or supersonic jet under static conditions. In addition, a listing of the computer program (called INTEG) to predict absolute turbulent mixing noise levels at 90 deg to the jet axis using laser velocimeter turbulence measurement is also given. A detailed description of these two programs in the form of a user's guide is given in the main volume of this report Author (GRA)

N79-22882# HTL Industries Inc Santa Ana Calif Div

APPLICABILITY OF FIBER OPTICS TO AIRCRAFT FIRE DETECTION SYSTEMS Final Report, 15 May - 15 Aug

Richard D McGunigle Howard W Jackson and Robert R Beavers Oct 1978 73 p refs

(Contract F33615-75-C-2030 AF Proj 3048)

(AD-A063974 HTL-K-West-D-1530 AFAPL-TR-78-84) Avail NTIS HC A04/MF A01 CSCL 20/6

A review of the state-of-the-art in ultra-violet conducting fiber optics and related system components was conducted with the objective of evaluating their potential applicability to solar blind UV fire detection systems From this basis conceptual systems were developed and analyzed to assess the potential payoff of incorporating optical enhancement to improve the performance and reduce the initial and life cycle cost size and weight of such systems and to effect detector circuit simplification and improvement in system reliability Author (GRA)

N79-22957* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

AMES RESEARCH CENTER PUBLICATIONS, 1977

Apr 1979 123 p

(NASA-TM-78514 A-7704) Avail NTIS HC A06/MF A01 CSCL 05B

This bibliography lists 786 formal NASA publications journal articles books chapters of books patents and contractor reports which appeared during 1977 or which were not included in previous annual bibliographies Citations are arranged by directorate type of publication and author Each NASA report is identified by a technical report and accession number to facilitate ordering. An author index is provided

N79-22964# RAND Corp Santa Monica Calif

AN APPRAISAL OF MODELS USED IN LIFE CYCLE COST ESTIMATION FOR USAF AIRCRAFT SYSTEMS Interim Report

Kenneth E Marks H Garrison Massey and Brent D Bradley Oct 1978 128 p

(Contract F49620-77-C-0023)

RAND/R-2287-AF) (AD-A064333

HC A07/MF A01 CSCL 14/1

Avail NTIS

Although life cycle analysis is widely used as a management tool considerable uncertainty still exists about its effectiveness with respect to economic tradeoffs, funding decisions, and resource allocations. This report evaluates some of the most widely used life cycle cost (LCC) models AFR 173-10 models (BACE AND CACE) the Logistics Support Cost Model the Logistics Composite model the MOD-METRIC model AFM 26-3 Manpower Standards Air Force Logistics Command Depot Maintenance Cost Equations the DAPCA model and the PRICE model The models are rated within a framework incorporating a set of life cycle cost elements and a set of cost driving factors. Color-coded illustrations summarize the results. The models are shown to have many shortcomings that limit their usefulness for life cycle analyses in which estimates of absolute incremental cost are required Specific areas are identified where driving factor/cost

element combinations are not adequately addressed Author (GRA)

N79-22996# Von Karman Inst for Fluid Dynamics, Rhode-Saint-Genese (Belgium)

STOL TECHNOLOGY, VOLUME 1

Sep 1973 198 p refs Lecture held at Rhode-Saint-Genese, Belgium 10-14 Sep 1973 2 Vol

(VKI-Lecture-Series-60-Vol-1) Avail NTIS HC A09/MF A01 Airworthiness and certification of civil aircraft wind tunnel corrections for STOL models large low speed wind tunnel requirements transport aircraft and takeoff and landing ground rules are discussed

N79-22997# Civil Aviation Authority London (England) AIRWORTHINESS AND CERTIFICATION ASPECTS OF CIVIL AIRCRAFT FOR STOL

W R B Bryder and J A Carrodus In Von Karman Inst for Fluid Dyn STOL Technol Vol 1 Sep 1973 22 p

Avail NTIS HC A09/MF A01

A brief account of the work in hand is presented. The CAA provisional airworthiness flight requirements for powered-lift aircraft are discussed. Those areas where further work most needs to be done if the first certifications of STOL transport aircraft are to provide adequate safety levels without imposing undue economic penalty are indicated SES

N79-22998# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

WIND TUNNEL CORRECTIONS FOR STOL MODELS

M Carbonaro In its STOL Technol Vol 1 Sep 1973 45 p refs

Avail NTIS HC A09/MF A01

A number of operational problems associated with the wind tunnel testing of V/STOL aircraft including helicopters are reviewed Wall corrections use of ventilated wall testing for ground effect, and flow distributions in the tunnel circuit are SES discussed

N79-22999# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

REVIEW OF LARGE LOW SPEED WIND TUNNEL REQUIRE-MENTS FOR STOL TESTING

P E Colin In its STOL Technol Vol 1 Sep 1973 11 p refs

Avail NTIS HC A09/MF A01

The low speed end of the flight range in aerodynamic testing facilities was investigated in order to maintain a fully competitive industry. The types of aircraft to be considered for low speed testing problem areas and facility requirements and proposals for low speed wind tunnels in the USA and in Europe

N79-23000# Mississippi State Univ Mississippi State Raspet

Flight Research Lab
REVIEW LECTURE ON TRANSPORT AIRCRAFT CON-CEPTS, UTILIZATION AND PROSPECTS

Ernest J Cross Jr and Daniel Fraga (AFFDL) In Von Karman Inst for Fluid Dyn STOL Technol Vol 1 Sep 1973 61 p

Avail NTIS HC A09/MF A01

Performance requirements for short takeoff and landing capabilities impose special design problems that are particularly difficult to resolve for large transport aircraft are presented. The fundamental relationships involved in the takeoff and landing distance of high speed aircraft were reviewed. The lift coefficient and lift drag ratio subject to aerodynamic improvement are discussed The lift systems discussed include (1) high performance mechanical lift devices (2) boundary layer control high lift devices (3) deflected slipstream (4) internally blown jet flap (5) augmenter wing (6) externally blown jet flap (7) direct lift

N79-23001# Mississippi State Univ Mississippi State TAKEOFF AND LANDING GROUND RULES

Ernest J Cross, Jr In Von Karman Inst for Fluid Dyn STOL Technol, Vol 1 Sep 1973 22 p refs

Avail NTIS HC A09/MF A01

Ground rules applicable to powered lift aircraft are presented and reviewed A list of rules for defining military STOL performance was developed. The components of the proposed rules are discussed so that the reader may gain information useful for aircraft design

N79-23002# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

STOL TECHNOLOGY, VOLUME 2

Sep 1973 344 p refs Lecture held at Rhode-Saint-Genese, Belgium 10-14 Sep 1973 2 Vol

(VKI-Lecture-Series-60-Vol-2) Avail NTIS HC A15/MF A01 Volume 2 of a two volume lecture series is presented. The following topics are discussed (1) airworthiness and certification aspects of civil aircraft for STOL, (2) wind tunnel corrections for STOL models, (3) review of large low speed wind tunnel requirements for STOL testing (4) takeoff and landing ground rules (5) flight dynamic problems with STOL operations (6) aerodynamics and performance characteristics of direct lift schemes (7) engine integration and noise considerations for STOL aircraft, and (8) special ground testing facilities and testing techniques for STOL aircraft

N79-23003# Hawker Siddeley Aviation Ltd Hatfield (England) FLIGHT DYNAMICS PROBLEMS WITH STOL OPERATION

Michael Fay In Von Karman Inst for Fluid Dyn STOL Technol Vol 2 Sep 1973 33p refs

Avail NTIS HC A15/MF A01

The stability and control characteristics of large transport aircraft specifically designed to operate from runways of 1 500 ft and 2 000 ft are considered GY

N79-23004# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

THE AERODYNAMICS AND PERFORMANCE CHARACTER-ISTICS OF DIRECT LIFT SCHEMES

H Friedel In its STOL Technol Vol 2 Sep 1973 30 p refs

Avail NTIS HC A15/MF A01

In the first part, the fundamental relations for calculation of the performance characteristics are given with a detailed definition of the forces acting on direct lift schemes. On the basis of some measurements given in the literature the jet-induced interference effects are explained. The second part is concerned with the performance characteristics of direct lift schemes. At first the influences of jet lift on the point-performance characteristics in horizontal flight climb and turn are shown. In the following sections the short take-off and short landing characteristics are explained in some detail. A short view on unsteady turn performance for aircrafts with thrust deflection is given also G Y

N79-23005# Rolls-Royce Ltd Derby (England) ENGINE INTEGRATION AND NOISE CONSIDERATIONS

FOR STOL AIRCRAFT J A Hooper In Von Karman Inst for Fluid Dyn STOL Technol Vol 2 Sep 1973 50 p

Avail NTIS HC A15/MF A01

The achievement of short field performance together with good operational and economic characteristics impose demands upon the engine which can have a considerable influence on engine design. Various forms of lift augmentation devices are considered and the associated engine/airframe integration problems are discussed. The resulting effect on engine design is illustrated by considering some current engine proposals. Noise is an extremely important consideration and the means and cost of achieving low noise levels are considered. The considerable reduction in community noise levels that can be achieved is illustrated

N79-23006# McDonnell-Douglas Corp Long Beach Calif V/STOL Systems Aerodynamic Technology

AERODYNAMICS AND PERFORMANCE CHARACTERIS-TICS OF WING LIFT AUGMENTATION SCHEMES

Michael L Lopez In Von Karman Inst for Fluid Dyn STOL Technol Vol 2 Sep 1973 75 p refs

Avail NTIS HC A15/MF A01

A discussion is presented which gives an introductory survey of aerodynamics and performance characteristics of wing lift augmentation schemes. Attention is drawn to those methods of increasing lift that would be categorized as circulation control high lift concepts. Emphasis is placed on those circulation control high lift concepts involving the application of the jet-flap principle Included among these concepts are the externally blown and internally ducted jet flap, the augmentor wing or ejector jet flap and the over-the-wing or upper surface blown flap. Other methods for increasing lift are briefly discussed so that the nonspecialist to this field might recognize the basic problems and the aerodynamic potential fo alternative schemes for STOL aircraft applications

N79-23007# Office National d Etudes et de Recherches Aerospatiales Paris (France)

SPECIAL GROUND TESTING FACILITIES AND TESTING TECHNIQUES FOR STOL AIRCRAFT

Ph Poisson-Quinton and J Christophe In Von Karman Inst for Fluid Dyn STOL Technol Vol 2 Sep 1973 82 p

Avail NTIS HC A15/MF A01

Figures and illustrations are given for unusual characteristics of a STOL A/C basic testing on high lift devices in twodimensional rigs major tunnels for V/STOL testing STOL testing techniques engine simulation on STOL models simulation of the ground effect on STOL models development of a special V/STOL rig inside the ONERA-S1 mondane tunnel gust simulation by jet control in wind tunnels free flight techniques and ground simulators

N79-23008*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

COMPUTER FORMULATIONS OF AIRCRAFT MODELS FOR SIMULATION STUDIES

James C Howard May 1979 73 p refs

(NASA-TP-1470 A-7477) Avail NTIS HC A04/MF A01 CSCL 02A

Recent developments in formula manipulation compilers and the design of several symbol manipulation languages enable computers to be used for symbolic mathematical computation. A computer system and language that can be used to perform symbolic manipulations in an interactive mode are used to formulate a mathematical model of an aeronautical system. The example demonstrates that once the procedure is established the formulation and modification of models for simulation studies can be reduced to a series of routine computer operations

N79-23012*# National Aeronautics and Space Administration Langley Research Center Hampton Va

FLIGHT INVESTIGATION OF PILOTING TECHNIQUES AND CROSSWIND LIMITATIONS USING A RESEARCH TYPE CROSSWIND LANDING GEAR

Bruce D Fisher Perry L Deal Robert A Champine and James M Patton Jr May 1979 55 p refs

(NASA-TP-1423 L-12682) Avail NTIS HC A04/MF A01 CSCL 01A

A research-type crosswind landing gear was tested in a flight program which used a light STOL transport in strong crosswind conditions The research-type crosswind landing gear used enabled the airplane to land to crosswinds up to a magnitude of 25 to 30 knots. Three modes of landing-gear operation were investigated preset automatic and castor (passive self-alignment) Actual test data and histograms are given for the 195 visual flight rules crosswind landings made JMS

N79-23013*# National Aeronautics and Space Administration Langley Research Center Hampton Va

AERODYNAMIC CHARACTERISTICS AT MACH NUMBERS OF 15, 18, AND 20 OF A BLENDED WING-BODY CONFIGURATION WITH AND WITHOUT INTEGRAL CANARDS

A Warner Robins Milton Lamb and David S Miller May 1979 56 p refs

(NASA-TP-1427 L-12727) Avail NTIS HC A04/MF A01 CSCL 01A

An exploratory experimental and theoretical investigation was made of a cambered twisted and blended wing-body concept with and without integral canard surfaces. Theoretical calculations of the static longitudinal and lateral aerodynamic characteristics of the wing-body configurations were compared with the characteristics obtained from tests of a model in the Langley Unitary Plan wind tunnel Mach numbers of 15 18 and 20 and a Reynolds number per meter of 6.56 million were used in the calculations and tests. Overall results suggest that planform selection is extremely important and that the supplemental application of new calculation techniques should provide a process for the design of supersonic wings in which spanwise distribution of upwash and leading-edge thrust might be rationally controlled and exploited

N79-23016*# Boeing Commercial Airplane Co Seattle Wash COMPUTER PROGRAM TO CALCULATE THREE-DIMENSIONAL BOUNDARY LAYER FLOWS OVER WINGS WITH WALL MASS TRANSFER Final Report

J D McLean and J L Randall May 1979 96 p refs

(Contract NAS1-15022)

(NASA-CR-3123 D6-46976) Avail NTIS HC A05/MF A01

A system of computer programs for calculationg three dimensional transonic flow over wings, including details of the three dimensional viscous boundary layer flow was developed The flow is calculated in two overlapping regions an outer potential flow region and a boundary layer region in which the first order three dimensional boundary layer equations are numerically solved A consistent matching of the two solutions is achieved iteratively thus taking into account viscous-inviscid interaction. For the inviscid outer flow calculations, the Jameson-Caughey transonic wing program FLO 27 is used, and the boundary layer calculations are performed by a finite difference boundary layer prediction program. Interface programs provide communication between the two basic flow analysis programs. Computed results are presented for the NASA F8 research wing both with and without distributed surface suction.

N79-23017# ARO Inc Arnold Air Force Station Tenn
COMPARISON OF STORE TRAJECTORY AND AERODYNAMIC LOADS, AND MODEL FLOW-FIELD CHARACTERISTICS OBTAINED IN THE AEDC PWT/4T AND VFK/A WIND
TUNNELS AT MACH NUMBER 1 63 Final Report

D W Hill Jr J T Best and R H Tolbert AEDC Feb 1979 77 p refs

(AD-A065137 AEDC-TR-78-45) Avail NTIS HC A05/MF A01 CSCL 14/2

Tests were conducted in the VKF/A and PWT/4T wind tunnels at AEDC to obtain captive trajectory aerodynamic loads and flowfield data in order to assess the ability to reproduce trajectories from tunnel to tunnel. The data were obtained with a 0.05-scale generalized shape aircraft model an ogive-cylinder store model, and conical flow survey probes at and near the centerline fuselage station pylon and the wing 1/3-semispan station pylon. The tests were conducted at a Mach number of 1.63 with aircraft model angle of attack set at zero. Generally, the trajectories obtained in the two wind tunnels compared well. There was very good agreement in the translational motion of the store trajectories with only slight differences in the angular motion in selected cases.

N79-23020# Lockheed-Georgia Co., Marietta

DEVELOPMENT OF A VISCOUS VORTEX/WING INTERACTION PROGRAM FOR THICK WINGS WITH BOUNDED LEADING EDGE Final Report

Charles J Dixon and S Sampath 30 Nov 1978 93 p refs (Contracts N00014-74-C-0151 RR0141184)

(AD-A065181, LG78ER0227 ONR-CR215-233-4F) Avail NTIS HC A05/MF A01 CSCL 20/4

A hybrid viscous/potential flow program was developed to analyze the flow field on and around a swept thick wing with rounded leading edges and leading edge vortex flow. The program provides a computational package which includes four major programs run with proper interfacing in an iterative cycle. These programs include two viscous programs and two potential flow programs. The viscous flow programs consist of (1) a parabolic solution to the Navier-Stokes vorticity equation in a box around the leading edge vortex and (2) a three-dimensional second-order boundary layer program for infinite yawed wings. This program provides the boundary layer vorticity being fed into the vortex box The two potential flow programs are (1) the Hess surface singularity method for thick wings and fuselage combination and (2) a vortex lattice method to model the leading edge vortex These two programs provide the surface pressures and the viscous box boundary velocities. The program interfaces are developed by applying the concept to a 65 deg delta wing with a spanwise variation in leading edge radius. Operating experience is presented giving the results and knowledge gained in each cycle of the iterations. The method allows the designer to design or modify the leading edge shape to meet the desired performance and control requirements

N79-23028# Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio Aerodynamics and Airframe Branch

A NUMERICAL SOLUTION OF SUPERSONIC AND HYPER-SONIC VISCOUS FLOW FIELDS AROUND THIN PLANAR DELTA WINGS Final Report

Guion S Bluford Jr Sep 1978 235 p refs (AF Proj 2307)

(AD-A065632 AFFDL-TR-78-98)

AFFDL-TR-78-98) Avail NTIS

HC A11/MF A01 CSCL 01/3

A numerical technique was used to compute the supersonic and hypersonic viscous flow fields around thin planar delta wings

These solutions were obtained by solving the Navier-Stokes equations subject to a conical approximation. The integration technique used was the MacCormack finite-difference scheme Solutions were obtained for the upper-only lower-only and total flow fields around delta wings with supersonic leading edges.

GRA

N79-23046# Bristol Univ (England) Dept of Aeronautical Engineering

AN INVESTIGATION INTO THE TRANSIENT AERODYNAMICS ASSOCIATED WITH A SPOILER EMERGING INTO A UNIFORM AIRSTREAM BS Thesis

A Bannister and P B Tuffley Jun 1978 91 p refs (BU-219) Avail NTIS HC A05/MF A01

Tests were conducted to determine how the flow around a spoiler emerging into a uniform airstream develops. A water table model was used to provide a hydraulic analogy. Photographs show the results obtained. Tests were conducted in a low speed wind tunnel to determine pressure variation along the extended center line of a model spoiler. Plots show how the extent to which the spoiler has emerged is related to the extent of the separated region downstream.

Author (ESA)

N79-23047# Bristol Univ (England) Dept of Aeronautical Engineering

AN INVESTIGATION INTO THE PRESSURE DISTRIBUTIONS OVER A WING AND STORE COMBINATION AT LOW SPEEDS BS Thesis

S P Newbold and J E Zacharakis Jun 1978 149 p refs (BU-226) Avail NTIS HC A07/MF A01

A wind tunnel investigation was carried out in regard to pressure distributions over the surfaces of a wing section and store combination at an angle of incidence of 8 deg to a uniform airflow at a Reynolds number based on store diameter, of 1 6 x 100 000. Pressure distributions are presented for a range of separation distances between the wing and store. Results show that the presence of the wing section produced a large effect on the distribution over the store but the effect of the store on the airful pressure distribution was negligible. The results indicated a reduction in the effective store incidence when in close vicinity of the wing. The vortex pair formed on the store vanished when the separation distance of the two bodies was reduced below one store diameter. The effect of Reynolds number on the pressure distribution was also investigated. Author (ESA)

N79-23048# Bristol Univ (England) Dept of Aeronautical Engineering

THE EFFECT OF SURFACE IMPERFECTIONS ON THE AERODYNAMIC PERFORMANCE OF AN AIRFOIL AT MODERATE REYNOLDS NUMBERS BS Thesis

T R Byram and N J Came Jun 1978 68 p refs (BU-217) Avail NTIS HC A04/MF A01

The aerodynamic performance of a two-dimensional NACA 0015 airfoil was investigated over a range of Reynolds numbers from 1.5 to 4.5 x 100.000. The results correspond to higher free air Reynolds numbers than these due to wind tunnel turbulence of the order of 1 percent. Variations of lift, drag pitching moment, and control hinge moment were investigated for various imperfections. These imperfections covered variations in both leading edge and control surface profile. For all cases tested including the standard airfoil there was a dependence of the results on the Reynolds number. In general, the introduction of imperfections produced a poorer performance compared to the standard airfoil section.

N79-23061# Royal Aircraft Establishment Farnborough (England) Aerodynamics Dept

A BRIEF REVIEW OF AIR FLIGHT WEAPONS

George G Brebner In AGARD Missile Aerodynamics Feb 1979 12 p

Avail NTIS HC A17/MF A01

The differences in design objectives and consequently in geometry between aircraft and weapons, and the aerodynamic repercussions are described Various general categories of air flight weapons are listed propelled and unpropelled guided and

unguided and in the particular category of propelled guided weapons different classes are identified. The following components of a guided weapon are described briefly warhead propulsive unit safety and arming mechanism fuze guidance system and control system. Their functions and their effects on the aerodynamic design are described. The place of the aerodynamicist in the design of a guided weapon is discussed and related to the various stages of the design and development process

N79-23063# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt Goettingen (West Germany) Theoretische Stroemungsmechanik

AERODYNAMICS OF LOW ASPECT RATIO WINGS

W H Stahl In AGARD Missile Aerodynamics Feb 1979 64 p refs

Avail NTIS HC A17/MF A01

The types of wings are discussed which generally find application on missiles that is with wings having delta-rectangular trapezoidal or other planform of more or less small aspect ratio. An overview over the available experimental evidence for the flow fields of such wings is given, as well as a discussion of measured pressure distributions forces and moments at low and high speeds also the influence of Reynolds number is considered Various methods to predict the aerodynamic characteristics of such wings are reviewed and comparisons are made between theoretical and experimental results. An extensive list of references is provided

N79-23060# Federal Aviation Administration Washington D C NATIONAL AIRPORT SYSTEM PLAN 1978 - 1987 [1978] 446 p Original contains color illustrations

Avail NTIS MF A01, SOD HC

The need for civil airports in the decade ahead is presented A system of public airports the formulation coordination and implementation of the National airport system plan, the airport and its system role system development requirements. National requirements and state requirements and individual airport data are discussed SES

N79-23061# Analysis and Technology Inc North Stonington

ANALYSIS OF VISUAL DETECTION PERFORMANCE FALL 1978 EXPERIMENT Interim Report, Jan - Dec 1978

N C Edwards Jr (Coast Guard Groton, Conn.) T J Mazour D R Bouthilette and S R Osmer (Coast Guard Groton Conn.) Dec 1978 131 p refs

(Contract N00014-78-C-0810)

(AD-A065118 USCG-D-03-79) HC A07/MF A01 CSCL 06/7

From 11 September 1978 to 6 October 1978 a visual detection experiment was conducted in Block Island sound by the U.S. Coast Guard Research and Development Center. It was the first in a series of experiments designed to improve search planning guidance contained in the National Search and Rescue Manual This was a controlled experiment involving 82 and 95 foot cutters 41 and 44 foot boats helicopters and fixed wing aircraft searching for white 16 foot boat targets anchored at predetermined locations within the search area. Through the use of a microwave ranging system the positions of searchers and targets could be accurately reconstructed to determine the lateral range of targets that were detected as well as targets not detected Thus probability of detection versus lateral range curves could be developed and, by integrating these curves, sweep width could be determined as well A total of 695 detection opportunities were generated A sophisticated binary multivariate logistic regression computer program was used to develop sweep width estimates for the environmental conditions experienced. Of the eight visual detection parameters investigated visibility wind speed swell height cloud cover search unit type and duration of search were determined to have a significant effect on sweep width The sweep width is an excellent measure of search unit performance A more rapid degradation of sweep width was found for deteriorating environmental conditions than is now predicted by the National Search and Rescue Manual The methods used to conduct this experiment and analyze the data were

found to be successful and are recommended for future

N79-23062# Air Force Geophysics Lab Hanscom AFB Mass FORWARD SCATTER METER MEASUREMENTS OF SLANT VISUAL RANGE

Wayne S Hering and Edward B Geisler 9 Aug 1978 29 p refs

(AD-A064429 AFGL-TR-78-0191 AFGL-AFSG-393) Avail NTIS HC A03/MF A01 CSCL 20/6

The potential for remote tower measurements of point visibility in the determination of slant range visibility for aircraft landing operations was explored through analysis of data collected at the Air Force Geophysics Laboratory Weather Test Facility at Otis AFB Massachusetts This report described initial experiments that deal with an analysis of the small scale variability of extinction coefficient in time and space. Data from two instrumented towers spaced 1500 ft apart were classified for investigation of the horizontal variability of visibility at elevations up to 100 ft and space-time variability for lag periods from 0 to 10 minutes The preliminary tests give additional evidence that the runway visual range (RVR) measurements alone often are not representative of pilot visibility during approach and touchdown. Remote measurements of visibility using either a 50-ft or 100-ft instrumented tower would add significantly to the real safety of sea-to-land operations under conditions of Categories I, II and Illa through an improved description of conditions related to airfield visibility

N79-23063# Naval Ocean Systems Center San Diego Calif OMEGA POSSIBILITIES LIMITATIONS, OPTIONS, AND OPPORTUNITIES Final Report, Jan - Jul 1978 E R Swanson J E Britt and A N Smith Jun 1978 86 p

(AD-A065027 NOSC/TR-283) Avail NTIS HC A05/MF A01 CSCL 17/7

Omega is reviewed from the vantage point of several years operational experience with the system in nearly final configuration After identification of some possible shortcomings or deficiencies system design parameters are re-examined with a view to determining possible investigations modifications or changes which might mitigate or lead to elimination of difficulties. The primary form of review is a re-examination of design in hindsight using modern theory and considering modern engineering options to determine weaknesses and areas susceptible to improvement Potential coverage limitations were identified in several areas while a coverage deficiency in central North America is to be expected Significant reception difficulties have been noted in aircraft Specific recommendations are made for investigations leading to improved receiver design and to mitigate reception problems in aircraft. Despite system maturity, a considerable and perhaps surprising latitude exists for modifications. Methods are presented by which one or more additional stations can be added without obsoleting existing equipment

N79-23064*# Textron Bell Helicopter Fort Worth Tex CORRELATION STUDY BETWEEN VIBRATIONAL ENVI-RONMENTAL AND FAILURE RATES OF CIVIL HELICOPTER COMPONENTS

Orlando Alaniz May 1979 75 p refs (Contract NAS1-15078)

(NASA-CR-159033) Avail NTIS HC A04/MF A01 CSCL 01C

An investigation of two selected helicopter types namely the Models 206A/B and 212 is reported. An analysis of the available vibration and reliability data for these two helicopter types resulted in the selection of ten components located in five different areas of the helicopter and consisting primarily of instruments electrical components and other noncritical flight hardware. The potential for advanced technology in suppressing vibration in helicopters was assessed. The are still several unknowns concerning both the vibration environment and the reliability of helicopter noncritical flight components. Vibration data for the selected components were either insufficient or inappropariate. The maintenance data examined for the selected components were inappropriate due to variations in failure mode identification inconsistent reporting or inaccurate information

NTIS

N79-23065# Douglas Aircraft Co Inc Long Beach Calif ACTIVE CONTROL TRANSPORT DESIGN CRITERIA

Robert W Harris and William W Rickard 9 Nov 1978 15 p refs. Backup document for AIAA Synoptic scheduled for publication in Journal of Aircraft Sep 1979 (Paper-6663) Avail NTIS HC A02/MF A01

The definition and background of active control technology are presented and the functions contemplated to be performed by active control systems are discussed. The various design criteria for each is discussed and the subject of government regulations affecting aircraft design is reported

N79-23066# Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio

AEROSPACE TRANSPARENT MATERIALS AND ENCLO-SURES (12TH)

Robert E Wittman Dec 1978 876 p refs Conf held at Long Beach Calif 24-28 Apr 1978 NTIS

(AD-A065049 AFFDL-TR-78-168) HC A99/MF A01 CSCL 01/3

The purpose of this report is to make available the technical papers presented at the Twelfth Conference on Aerospace Transparent Materials and Enclosures Thirty-eight technical papers are presented in seven sessions that address transparency design and performance characterization materials and processes and bird impact resistance. The papers contained herein

have been reproduced directly from the original manuscripts Author (GRA)

N79-23067# United Technologies Corp Stratford Conn Sikorsky Aircraft Div

HELICOPTER TRANSPARENT ENCLOSURES VOLUME 2 A GENERAL SPECIFICATION Final Report

Bruce F Kay Jan 1979 63 p refs (Contract DAAJ02-74-C-0065)

(AD-A065462 SES-501011 USARTL-TR-78-25B) NTIS HC A04/MF A01 CSCL 01/3

General specification design development and acceptance criteria are presented. Guidelines for performing tradeoffs between conflicting criteria are given

N79-23068# Sikorsky Aircraft Stratford Conn Sikorsky Aircraft Dıv

HELICOPTER TRANSPARENT ENCLOSURES VOLUME 1 **DESIGN HANDBOOK Final Report**

Bruce F Kay Jan 1979 461 p refs (Contract DAAJ02-74-C-0065)

(AD-A065268 SER-50966-Vol-1 USARTL-TR-78-25A-Vol-1) Avail NTIS HC A20/MF A01 CSCL 01/3

The Volume I design handbook is a comprehensive guide to the development of helicopter transparent enclosures. The handbook is structured in a manner that generally parallels the sequence of considerations used to develop helicopter transparencies. Separate chapters are devoted to subjects pertinent to the design analysis and testing of transparent enclosures Special characteristics and material properties are presented as applica-

N79-23069# Hughes Helicopters Culver City Calif

EVALUATION OF AN ENERGY DISTRIBUTION SYSTEM FOR HELICOPTER LANDING GEARS DURING HARD LANDING Final Report, 1 Mar 1977 - Sep 1978

A H Logan C A Waldon and F Fourt Nov 1978 120 p refs

(Contract DAAJ02-77-C-0019)

(AD-A065298 HH-78-149 USARTL-TR-44) Avail NTIS HC A06/MF A01 CSCL 01/3

An experimental program was conducted to evaluate a landing gear concept that redistributes the impact energy of an autorotational landing. This landing gear concept redistributes the impact energy by providing an interconnection between the front and rear landing gears. Through the interconnection as the rear landing gear moves from the flight position toward the full compressed position under landing impact, the front gear is impelled to move from the flight position toward the fully extended position. When these motions have been accomplished, the skids

remain on the ground surface throughout the landing greatly reducing the pitching moments. The landing gear was drop tested to demonstrate the effects of sink rate gross weight center-ofgravity (CG) location touchdown attitude (both pitch and yaw) ground resonance system damping and spring rate. The testing included drop velocities up to 19 5 feet per second and simulated forward and lateral speed landings. For purpose of design and development the OH-6A helicopter was used as the baseline aircraft and the landing gear was designed to require minimum modification to the OH-6A The results of the testing showed that the interconnected landing gear reduces the nosedown pitching velocities and angles during autororation landings. A cost analysis indicated that incorporation of the interconnected landing gear in new production aircraft would result in a return on investment greater than 2.1 GRA

Aerospace Medical Research Labs Wright-N79-23070# Patterson AFB Ohio

INFLUENCE OF GRIDBOARD LINE WIDTH AND SPACING ON WINDSCREEN DISTORTION MEASUREMENTS

Rickey C Seid and Herschel C Self Dec 1978 31 p AMRL-TR-78-93) (AD-A065821 NTIS Avail HC A03/MF A01 CSCL 12/1

Optical distortions of aircraft windscreens are commonly measured on photographs taken through the windscreens of a large flat Cartesian grid called a gridboard. Presently there are no accepted standards for the width of the lines or the size of the squares on gridboards. This study measured the effects of these variables upon measurements of vertical and horizontal magnifications to aid in establishing standards

N79-23071# Illinois Inst of Tech Chicago Dept of Mechanics and Mechanical and Aerospace Engineering

STUDIES OF THE DYNAMIC STALL OR AIRFOIL PROFILES FOR HELICOPTER ROTORS Final Report, 1 Jun 1975 -30 Sep 1978

Andrew A Fejer 20 Jan 1979 15 p refs (Grant DAHC04-75-G-0142)

(AD-A065106) Avail NTIS HC A02/MF A01 CSCL 20/4 The interaction of oscillations of the mean velocity of the relative flow with the periodic changes in angle of attack that are produced in the forward flight of helicopters on the airfoil profiles of the rotors has been investigated for the first time The study conducted in the IIT 2 ft x 2 ft oscillating flow wind tunnel coupled with visual observations in a small water tunnel has revealed that the aerodynamic characteristics of oscillating flows in steady flow documented by a number of investigators may be altered significantly when oscillations of the flow velocity are superimposed on those of the angle of attack of Author (GRA) the airfoil

N79-23072# Bristol Univ (England) Dept of Aeronautical Engineering

A STUDY OF THE SHERIFF'S WING BS Thesis R B Eckersley and N J Sibley Jun 1978 86 p refs

(BU-215) Avail NTIS HC A05/MF A01

A design study of the Sheriff aircraft's wing was undertaken to assess the proposed design and to investigate and suggest improvements. The Sheriff's slotted flap was examined and the utility of optimizing a hinge position with respect to take-off and landing was found to be small. The roll performance was predicted to be poor compared with other general aviation aircraft Simplicity of construction was also considered with respect to flaps. Although the study is specific to the Sheriff there are useful implications for light aviation to be considered

Author (ESA)

N79-23073# Bristol Univ (England) Dept of Aeronautical Engineering

THE ELECTRO-IMPULSE DE-ICING METHOD BS Thesis V G Mitriou and S G Jancovich Jun 1978 100 p refs (BU-227) Avail NTIS HC A05/MF A01

The mechanism of crack formation and the failure of ice due to the sudden displacement of the metal to which it is attached were investigated. Various tests were made to check the efficiency versatility, and possibility of future application of A horizontal contilever beam electroimpulse deicing system

was set up, part of which was covered by ice or a specific mixture of mortar whose properties simulated those of ice. Impacts were applied at various distances from the end of the beam and the pattern in which the ice or mortar layer failed was observed Parameters such as beam length distance from impact, layer thickness, and temperature of ice were taken into consideration. A simple theory for static loadings of the beam was also developed through which some numerical values for the various stiffnesses and strengths of the mortar were obtained. The extent to which this simple static case theory could realistically represent the dynamic situation was discussed. For all tests standard aircraft aluminum alloy was used.

N79-23074# Advisory Group for Aerospace Research and Development Paris (France)

HELICOPTER FATIGUE A REVIEW OF CURRENT RE-QUIREMENTS AND SUBSTANTIATION PROCEDURES

Feb 1979 74 p refs in ENGLISH partly in FRENCH Presented at the 47th Meeting of the Struct and Mater Panel, Florence 25-29 Sep 1978

(AGARD-R-674 ISBN-92-835-0232-9) Avail NTIS HC AO4/MF A01

A detailed review of current fatigue requirements and substantiation procedures in the United States United Kingdom Germany, Italy, and France in the field of helicopter fatigue is presented Although general requirements and specifications seem to be very similar approved procedures applied by manufacturers may sometimes appear to be rather arbitrary or in some cases to differ significantly from one firm to another

N79-23075# Army Aviation Research and Development Command St Louis Mo Structures and Aeromechanics Reach

US ARMY HELICOPTER FATIGUE REQUIREMENTS AND SUBSTANTIATION PROCEDURES

Robert A Wolfe and Robert W Arden In AGARD Helicopter Fatigue Feb 1979 p 1-12 refs

Avail NTIS HC A04/MF A01

The current fatigue criteria and testing requirements are provided for U.S. Army helicopter structures with primary emphasis on dynamic components. The comparative industry applications of the requirements were brought to light as a result of the Army's latest major helicopter competitions for the Utility Tactical Transport Aircraft System recently designated BLACK HAWK and the Advanced Attack Helicopter These competitions resulted in evaluations by the Army of four major helicopter companies (two competitors for each program) and provided significant lessons learned in future Army fatigue requirements primarily because of differences in loads application S/N curves shape criteria working level curve deviations and component testing techniques applied by each contractor. These differences and how they relate to the current Army requirements were addressed As a result of these lessons learned, the Army is in the process of specifying new fatigue requirements for future helicopter procurements JAM

N79-23076# Westland Helicopters Ltd Yeovil (England) HELICOPTER FATIGUE EVALUATION THE UK APPROACH

A D Hall In AGARD Helicopter Fatigue Feb 1979 p 13-20

Avail NTIS HC A04/MF A01

The philosophies of fatigue substantiation were used satisfactorily for the Lynx and it is considered that the practicability of the approach has been well established. The main concern was with the safe fatigue life substantiation of the vital components of a helicopter and consideration is given to three phases in the life cycle. Le design, development and production it is shown how the prototype aircraft is defined from the fatigue strength point of view and how flight testing and development testing of the prototype leads in turn to the production definition. J A M

N79-23077# Messerschmitt-Boelkow-Blohm G m b H Munich (West Germany)

FATIGUE LIFE ESTIMATION METHODS FOR HELICOPTER STRUCTURAL PARTS

F Och In AGARD Helicopter Fatigue Feb 1979 p 21-27 refs

Avail NTIS HC A04/MF A01

Analytical fatigue life estimation mainly consisted of three steps prediction of loads, determination of fatigue strength, and application of a damage hypothesis linking these two aspects Following the above mentioned three steps of fatigue life investigation methods for the prediction of loads were dealt with according to the available amount of information Similarly it then investigated methods describing the fatigue strength of components taking into account the influence of steady loads and the reduction of a mean S/N curve to a working level curve.

N79-23078# Costruzioni Aeronautiche Giovanni Agusta S.p.A. Gallarate (Italy)

PRESENT FATIGUE ANALYSIS AND DESIGN OF HELICOP-TERS REQUIREMENTS AND QUALIFICATION PRO-CEDURES

Pietro Alli In AGARD Helicopter Fatigue Feb 1979 p 29-46 refs

Avail NTIS HC A04/MF A01

The state-of-the-art in AGUSTA in the area of structural fatigue and fail-safe strength evaluation is reported. The need of general regulations and procedures was pointed out. The convenience of automatic procedures was underlined. JAM

N79-23079# Societe Nationale Industrielle Aerospatiale Paris (France) Helicopter Div

FATIGUE OF HELICOPTERS SERVICE LIFE EVALUATION METHOD

F Liard In AGARD Helicopter Fatigue Feb 1979 p 47-69 In ENGLISH and FRENCH

Avail NTIS HC A04/MF A01

The general principle of fatigue substantiation for helicopter components consists in evaluating the fatigue strength of the component determining the value and frequency of the loads to which it will be subjected during normal operation, and then deriving from these data the steps to be taken to make the possible occurrence of serious accidents due to the failure of the component extremely remote. The method differs for the parts mainly diluensioned by high cycle fatigue (rotors and gearboxes) and for those subjected to low cycle fatigue (e.g. fuselage) Safety is determined from the stress in the 1st case and the number of cycles in the 2d case. Where both types of fatigue are encountered various methods allow taking into account their superimposition, but each of them leads to practical problems These two modes of fatigue being two aspects of a same phenomenon it seems realistic to use a single approach and select the acceptable total risk, whether the damage is calculated for each load level or the tests are conducted under programmed loads. In both cases, it would be necessary to have the equal probability-of-failure curves between a few cycles and the infinite which has not been achieved to date. Composite materials could be given the same treatment as metals as regards fatigue strength and that their fail safety could be taken into account when the first deteriorate appear on external surfaces ARH

N79-23080*# National Aeronautics and Space Administration Langley Research Center Hampton Va

COMPARISON OF ELECTROMECHANICAL AND CATHODE-RAY-TUBE DISPLAY MEDIUMS FOR AN INSTRUMENT APPROACH DISPLAY

Terence S Abbott May 1979 16 p refs (NASA-TM-80069, L-12805) Avail NTIS HC A02/MF A01 CSCL 01D

The effect on pilot performance of replacing a single electromechanical display with similar cathode-ray-tube displays was studied. The effects of dimensionality, color and shading were evaluated with respect to the pilots ability to interpret and respond to displayed information.

N79-23081*# National Aeronautics and Space Administration Langley Research Center Hampton, Va

MINIATURE FLOW-DIRECTION AND AIRSPEED SENSOR FOR AIRPLANES AND RADIO CONTROLLED MODELS IN SPIN STUDIES

David D Kershner May 1979 27 p refs (NASA-TP-1467, L-12812) Avail NTIS HC A03/MF A01 CSCL 01D

A miniature flow direction and airspeed sensor was developed for use on 1/10- to 1/15 scale models and on full-scale airplanes engaged in spin research. The range of flow angles encountered in spinning flight (+ or - 120 degrees in angle of attack and + or - 55 degrees in sideslip) is larger than that of normal flight. These angles along with an effective airspeed range of 9 to 90 m/sec were measured with static accuracies of + or - 0 35 degrees for angle of attack + or - 0 25 degrees for sideslip angle, and + or - 1 m/sec for airspeed. The dynamic accuracy is adequate to measure the rapidly changing flow angles and airspeed without singificant distortion. The sensor is rugged enough to withstand both the airplane environment and that of the radio-controlled unpowered models

N79-23082# Draper (Charles Stark) Lab , Inc. Cambridge, Mass AN INTEGRATED FAULT-TOLERANT AVIONICS SYSTEM CONCEPT FOR ADVANCED AIRCRAFT Final Report

1 Feb 1979 326 p refs

(Contract N00019-78-C-0572)

(AD-A065136, R-1226) Avail NTIS HC A15/MF A01 CSCL 01/3

A conceptual baseline design for a highly integrated faultand damage-tolerant avionics architecture is presented. The architecture is generic in nature, and applicable to a broad range of aircraft types, including CTOL, VTOL and V/STOL and all classes from supersonic fighters to transports. The architecture embodies pools of modular resources configured to flexibly serve required functions on a priority basis. By including system elements which can serve multiple functions and taking maximum advantage of systematic fault-tolerance methods and procedures the design tends to minimize replication of elements and overall complexity. In concert with logistics and maintenance procedures designed around the pooled modular element approach the architecture can provide required performance, reliability damage tolerance and availability at minimum life-cycle costs Its inherent flexibility allows it to readily incorporate a wide variety of mission-specific elements and to easily adapt to growth and change as new elements and requirements arise

Author (GRA)

N79-23083# TRW Defense and Space Systems Group Redondo

STANDARD AVIONICS MODULES (SAM) FOR EXISTING MODEMS Final Report, Jul 1976 - Dec 1977

Douglas Au and Stanley Ogi Wright-Patterson AFB Ohio AFAL Oct 1978 428 p

(Contract F33615-76-C-1307 AF Proj 7662)

AFAL-TR-78-47) (AD-A065629 NTIS Avail

HC A19/MF A01 CSCL 09/5

The objective of this project was to demonstrate the feasibility and cost effectiveness of applying the Standard Avionic Modules concept to communication/navigation ECCM modems. To make the project more tractable and more relevent two L-band com/nav systems and a general PN PSK modem were considered two com/nav systems were JTIDS and GPS and the PN PSK modem was an AJ modem using PN spreading and was capable of a data rate of 384 KBPS. A performance analysis resulted in a set of composite performance requirements. Signal processing functions were defined which would satisfy the performance requirements. With the performance requirements and signal processing functions several architectures were analyzed and partitioning of the modem function was undertaken. The final configuration of the modem was directly dependent upon the physical packaging technique adapted The Navy SHP approach was compared to the Air Force ATR standard specifically the 1/2 ATR standard and was discarded because of several deficiencies

N79-23084*# Pratt and Whitney Aircraft Group East Hartford Conn Commercial Products Div

VARIABLE CYCLE ENGINE TECHNOLOGY PROGRAM PLANNING AND DEFINITION STUDY Final Report

J S Westmoreland and A M Stern Sep 1978 89 p (Contract NAS3-20811)

(NASA-CR-159539. PWA-5581-12) NTIS Avail HC A05/MF A01 CSCL 21E

The variable stream control engine VSCE-5028 was selected as the base engine with the inverted flow engine concept selected as a backup Critical component technologies were identified, and technology programs were formulated Several engine configurations were defined on a preliminary basis to serve as demonstration vehicles for the various technologies. The different configurations present compromises in cost technical risk and technology return. Plans for possible variably cycle engine technology programs were formulated by synthesizing the technology requirements with the different demonstrator configurations

N79-23085*# Pratt and Whitney Aircraft Group, East Hartford

STUDY OF BLADE ASPECT RATIO ON A COMPRESSOR FRONT STAGE AERODYNAMIC AND MECHANICAL DESIGN REPORT

G D Burger D Lee and D W Snow Mar 1979 84 p refs (Contract NAS3-20809)

PWA-5583-25) (NASA-CR-159555 NTIS HC A05/MF A01 CSCL 21E

A single stage compressor was designed with the intent of demonstrating that for a tip speed and hub-tip ratio typical of an advanced core compressor front stage the use of low aspect ratio can permit high levels of blade loading to be achieved at an acceptable level of efficiency. The design pressure ratio is 1.8 at an adiabatic efficiency of 88.5 percent. Both rotor and stator have multiple-circular-arc airfoil sections. Variable IGV and stator vanes permit low speed matching adjustments. The design incorporates an inlet duct representative of an engine transition duct between fan and high pressure compressor

N79-23086*# National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

EFFECT OF PRIMARY-ZONE EQUIVALENCE RATIO ON POLLUTANT FORMATION

Russell W Claus May 1979 20 p refs

(NASA-TP-1463 E-9896) Avail NTIS HC A02/MF A01 CSCL 21E

Test were conducted to determine the effect of primaryzone equivalence ratio on the formation of smoke and other gaseous pollutants in an experimental can combustor. Several fuel injection techniques were examined at primary-zone equivalence ratios from 0.8 to 2.0. The main emphasis was on reducing fuel-rich-combustion smoke levels. Two of the four fuel injection configurations studied produced smoke levels below a smoke number of 20 at a primary-zone equivalence ratio of about 1.7 As the fuel mixing and atomization were recorded at primary-zone equivalence ratios as high as 20 The gaseous emissions of unburned hydrocarbons carbon monoxide and oxides of nitrogen were quite sensitive to the fuel injection configuration as well as to the primary-zone equilvalence ratio

N79-23087*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif

EFFECT OF NUMBER OF PROBES AND THEIR ORIENTA-TION ON THE CALCULATION OF SEVERAL COMPRESSOR FACE DISTORTION DESCRIPTORS

Frederick Stoll Jeffrey W Tremback and Henry H Arnaiz May 1979 42 p refs

(NASA-TM-72859, H-1070) Avail NTIS HC A03/MF A01 CSCL 21E

A study was performed to determine the effects of the number and position of total pressure probes on the calculation of five compressor face distortion descriptors. This study used three sets of 320 steady state total pressure measurements that were obtained with a special rotating rake apparatus in wind tunnel tests of a mixed-compression inlet. The inlet was a one third scale model of the inlet on a YF-12 airplane and it was tested in the wind tunnel at representative flight conditions at Mach numbers above 2.0. The study shows that large errors resulted in the calculation of the distortion descriptors even with a number of probes that were considered adequate in the past. There were errors as large as 30 and -50 percent in several distortion descriptors for a configuration consisting of eight rakes with five equal-area-weighted probes on each rake.

N79-23088# Aeronautical Research Labs Melbourne (Australia) DIGITAL DATA ACQUISITION SYSTEM FOR USE IN AIRCRAFT ENGINE CONDITION MONITORING

M T Adams Aug 1978 47 p refs

(ARL-Mech-Eng-Rept-151 AR-001-298) Avail NTIS HC A03/MF A01

A digital data acquisition system is described which was developed as part of a project to investigate assessment of aircraft engine condition from in-flight recording of a number of parameters. The recording system is based on a small inexpensive audio tape recorder and accpts up to 12 analogue inputs and 4 digital inputs. Recording of data in digital form is made on a standard cassette using a novel frequency coding technique. Other novel aspects of the system are the successful application of a computer-like architecture to an essentially simple system and the ease with which data can be displayed for calibration and pre-flight checks with simple hand held test gear.

N79-23089# North Carolina State Univ at Raleigh Engineering Design Center

AN EXPERIMENTAL STUDY OF THE RESPONSE OF A TURBO-MACHINE ROTOR TO A LOW FREQUENCY INLET DISTORTION Interim Report, Jan 1976 - Dec 1978

Larry Hardi Dec 1978 164 p refs Prepared in cooperation with United Technol Res Center

(Contract F44620-76-C-0055 Grant AF-AFOSR-2802-75) (AD-A064776 NCSU/EDC-78-6 AFOSR-79-0073TR) Avail NTIS HC A08/MF A01 CSCL 21/5

As part of a joint technical effort involving North Carolina State University and United Technologies Research Center an experiment was conducted to measure the response of an isolated turbomachine rotor to a distortion in inlet axial velocity. A once-per-revolution sinusoidal variation in axial velocity with an amplitude of approximately twenty percent of the average axial velocity was generated by an upstream screen. The response of the rotor was studied using pressure transducers and skin friction gages mounted on one of the rotor blades and a velocity probe at the rotor exit plane as well as with standard stationary frame pneumatic instrumentation. The rotor was operated in undistorted flow to establish the quasi-steady behavior of the compression system. When the air inlet angle was reduced past a certain limit the rotor began to experience rotating stall When the rotor was operated in distorted flow the pressures on the surface of the instrumented blade were observed to vary as a function of the instantaneous inlet angle. These variations were greatest at the leading edge of the airfoil and became smaller toward the trailing edge. This concentration of activity in the leading edge region is more pronounced than has been observed for isolated airfoils. As the instrumented blade traversed the distortion, it was observed to operate transiently at inlet angles below the quasi-steady stall point in an apparently unstalled condition

N79-23090# General Electric Co Cincinnati Ohio Aircraft Engine Group

ANALYTICAL DERIVATIVES Final Technical Report, Jun Sep 1978

D F Berg W C Colley and G L Converse Dec 1978 72 p (Contract F33615-78-C-2203 AF Proj 3066) (AD-A064944 R78AEG517 AFAPL-TR-78-101) Avail NTIS HC A04/MF A01 CSCL 21/5

The variable cycle engines now being studied for preliminary engine-aircraft design have greatly increased the complexity of engine modeling control element design and cycle calculation

relative to the simpler turbofan and turbojet engines which preceded them. The production of engine data is the major computations cost element in mission studies and optimization investigations this problem can become even more severe in the future unless improvements in cycle calculations and component modeling techniques are developed and introduced now The current method of obtaining balanced cycle data points is to use the simultaneous Newton-Raphson iteration method The partial derivatives are obtained by numerical differentiation This report documents the results obtained by calculating the partial drivatives from analytical expressions obtained by differentiating a cycle deck. Examples illustrating both the method of obtaining the analytical derivatives as well as setting up the control logic are given. A cost comparison was carried out between two engine simulations using numerical derivatives and the same pair of engine simulations using analytical derivatives. A data matrix consisting of the same 411 operating points was used for each of the engine simulation comparisons GRA

N79-23091# General Electric Co Lynn Mass Aircraft Engine Group

ASSESSMENT OF AUGMENTED ELECTRONIC FUEL CONTROLS FOR MODULAR ENGINE DIAGNOSTICS AND CONDITION MONITORING Final Report, Sep 1977 - Jun 1978

Daniel R Gilmore Jr Harold J Jordan and Alan D Pisano Dec 1978 149 p refs

(Contract DAAJ02-77-C-0065 DA Proj 1L2-62209-AH-76) (AD-A065128 USARTL-TR-78-32) Avail NTIS HC A07/MF A01 CSCL 21/5

Fault isolation to the module and line replaceable unit (LRU) level by means of a Diagnostic and Condition Monitoring (D and CM) System integrated with a Full-Authority Digital Electronic Control (FADEC) is evaluated in this study. A preliminary assessment of the D and CM system parameters required for performing the diagnostic functions on the current T700 engine is also included in the study.

Author (GRA)

N79-23092# Kaman Avidyne Burlington, Mass WIND-TUNNEL SHOCK-TUBE SIMULATION AND EVALUATION OF BLAST EFFECTS ON AN ENGINE INLET Final Report, Oct 1975 - Dec 1977

J Ray Ruetenik and Robert F Smiley 15 Mar 1978 236 p

(Contract DNA001-76-C-0107)

(AD-A065388 AD-E300451 KA-TR-147 DNA-4590F) Avail NTIS HC A11/MF A01 CSCL 21/5

This report describes a program for simulating blast wave intercepts with a scaled aircraft engine in subsonic flight using the shock tube technique for firing the blast-type waves. Three large 226 inch-diameter shock tubes were installed in the AEDC 16T (16 ft sq) transonic wind tunnel and were used to project blast waves at a 01-scale B-1 aircraft model. Forty-five firings were made covering tunnel speeds of Mach 0 055 0 70 0 85 and 0 90 blast overpressures (scaled to 1 atm ambient pressure) from 2 to 6 psi 0 deg and 5 deg yaw and inlet flow rates representative of cruise and maximum power conditions The model inlets were instrumented with 40 combination steady-state and dynamic total-pressure probes at each engine face section and other dynamic transducers to measure incident blast wave properties and inlet internal ramp and cowl pressures Calculations of blast pressures in the inlets made with the KA BID code satisfactorily reproduced the principal features of the observed inlet duct and engine fact pressures. Four potentially adverse effects to engine operation from blast interaction were identified blast-induced distortion fan choking afterburner blow-out and shock-boundary layer induced distortion

N79-23093# Pratt and Whitney Aircraft Group West Palm Beach Fla Government Products Div

LO-FREQUENCY AUGMENTOR INSTABILITY INVESTIGA-TION COMPUTER PROGRAM USER'S MANUAL Report, 1 Mar 1976 - 1 Apr 1978

P L Russell G Brant and R Ernst 18 Dec 1978 307 p (Contract F33615-76-C-2024) (AD-A065774 PWA-FR-9797 AFAPL-TR-78-83) Avail NTIS HC A14/MF A01 CSCL 21/2

This report describes the computer code and the models developed to form the computer code used to analyze low frequency augmentor instability (rumble). Rumble occurs mainly at high fuel-air ratios and at flight Mach numbers and altitudes where low duct inlet air temperatures and pressures exist. The model was developed in conjunction with and checked by two experimental programs.

N79-23094*# Pennsylvania State Univ University Park Applied Research Lab

THE EFFECTS OF DESIGN AND OPERATING VARIABLES ON THE RESPONSE OF AN AXIAL FLOW FAN TO INLET FLOW DISTORTIONS MS Thesis

Adam M Yocum II 14 Jun 1978 229 p refs (Grant NsG-3031 Contract N00017-73-C-1418) (AD-A058959 TM-74-15) Avail NTIS HC A11/MF A01 CSCL 13/1

This thesis presents the results of a study of total-pressure and velocity circumferential distortions in an axial-flow fan Distorted inlet flow is an important problem to the turbomachine designer because nonuniform and distorted flows cause noise vibration a reduction in efficiency and also a reduction in the stability limits for a multistage compressor. Some of the sources of a nonuniform flow which are often unavoidable are wakes from upstream struts sharp bends in the inlet ducting flow separation in the inlet and vortices created by ingesting fluid from a boundary layer. The present study was conducted to provide some of the fundamental experimental data needed to understand distorted flow phenomena as affected by design and operating variables. The flow through an isolated rotor was examined at various operating conditions with six different distortions and three different blade stagger angles. Circumferential surveys were conducted upstream and downstream of the rotor using five-hole probes in the non-nulling mode. The measurements with the five-hole probes yielded the axial circumferential, and radial components of velocity and the total and static pressure

N79-23095# Office National d Etudes et de Recherches Aerospatiales Modane (France)

AFTERBODY TESTS IN THE MODANE HOT GAS BENCH [ESSAIS D'ARRIERE-CORPS AU BANC DE GAZ CHAUD DE MODANE]

M Pletin and J M Hardy (SNECMA) Paris Assoc Aeron et Astronautique de France Nov 1977 21 p refs in FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov 1977

(AAAF-NT-78-10 ISBN-2-7170-0495-5) Avail NTIS HC A02/MF A01 CEDOCAR Paris FF 17 (France and EEC) FF 21 (others)

With scale 1 10 models the Modane hot gas test bench was used to evaluate the internal performance of ejection systems for double flow jet engines at either high or low dilution rates. Flow simulation with hot gas permits elimination of corrections used for cold jet mixtures at the outlet of double flow high dilution rate motors. Since 1976 more than 800 tests were made on the afterbody of the CFM56 motor and other subjects with satisfactory results.

N79-23096# Bristol Univ (England) Dept of Aeronautical Engineering

THE TRAJECTORIES OF SPHERICAL PARTICLES IN FLOW THROUGH CASCADED TURNING VANES BS Thesis

A Hunt and N C Randle Jun 1978 74 p refs (BU-220) Avail NTIS HC A04/MF A01

Work carried out on tracking salt particles through the inlet turning cascade of the Olympus marine gas turbine is described. A method of theoretically tracking small spheres through a known field was developed and applied to the Olympus cascade assuming inviscid flow in an infinite cascade. Using a 1/4 scale model of the cascade experimental measurements were taken to check the validity of the computed flow field. The tracking calculation was applied to particles of salt and salt water with diameters ranging from 2 to 100 microns. Results show that the cascade

might be used as a filter for particles larger than 12.5 microns in diameter (for corrosion prevention). A formulation of the streamline curvature method for flow in a cascade is also presented.

Author (ESA)

N79-23097* National Aeronautics and Space Administration Langley Research Center Hampton Va

FILTERING TECHNIQUE BASED ON HIGH-FREQUENCY PLANT MODELING FOR HIGH-GAIN CONTROL Patent Frank R Niessen and John F Garren Jr inventors (to NASA) Issued 10 Apr 1979 7 p Filed 8 Dec 1977 Supersedes N78-17070 (16 - 08 p 0980)

(NASA-Case-LAR-12215-1 US-Patent-4 148 452 US-Patent-Appl-SN-858762 US-Patent-Class-244-195 US-Patent-Class-244-83G US-Patent-Class-318-585 US-Patent-Class-318-616,

US-Patent-Class-364-434) Avail US Patent and Trademark Office CSCL 01C

This invention was an improvement in aircraft control systems that utilized feedback motion sensors to generate a signal to control the aircraft. The improvement consisted essentially of a complementary filter comprising a simplified model of the aircraft a high pass filter a low pass filter and a summing amplifier. The control signal was applied to the simplified model of the aircraft which attempted to compute the vehicle response to the signal. This computed response was then fed into the high pass filter to eliminate long term errors in the calculated response with the result that a good estimate of the high frequency content of the aircraft motion was obtained in order to obtain a good estimate of the low frequency content of the motion a rate gyro signal was fed through the low pass filter that eliminates all of the offending noise.

Official Gazette of the U.S. Patent and Trademark Office

N79-23098*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

A PILOTED SIMULATOR STUDY ON AUGMENTATION SYSTEMS TO IMPROVE HELICOPTER FLYING QUALITIES IN TERRAIN FLIGHT

Robert T N Chen Peter D Talbot Ronald M Gerdes and Daniel C Dugan Mar 1979 57 p (NASA-TM-78571, A-7769) Avail NTIS HC A04/MF A01 CSCL 01C

Four basic single-rotor helicopters one teetering on articulated and two hingeless which were found to have a variety of major deficiencies in a previous fixed-based simulator study were selected as baseline configurations. The stability and control augmentation systems (SCAS) include simple control augmentation systems to decouple pitch and yaw responses due to collective input and to quicken the pitch and roll control responses. SCAS of rate-command type designed to optimize the sensitivity and damping and to decouple the pitch-roll due to aircraft angular tate and attitude-command type SCAS. Pilot ratings and commentary are presented as well as performance data related to the task SCAS control usages and their gain levels associated with specific rotor types are also discussed.

N79-23099*# Massachusetts Inst of Tech Cambridge INVESTIGATION OF THE MULTIPLE METHOD ADAPTIVE CONTROL (MMAC) METHOD FOR FLIGHT CONTROL SYSTEMS Final Report

M Athans Y Baram D Castanon, K P Dunn C S Green W H Lee N R Sandell Jr, and A S Willsky May 1979 413 p refs

(Grant NsG-1018)

(NASA-CR-3089) Avail NTIS HC A18/MF A01 CSCL 01C

The stochastic adaptive control of the NASA F-8C digital-fly-by-wire aircraft using the multiple model adaptive control (MMAC) method is presented. The selection of the performance criteria for the lateral and the longitudinal dynamics the design of the Kalman filters for different operating conditions the identification algorithm associated with the MMAC method the control system design, and simulation results obtained using the real time simulator of the F-8 aircraft at the NASA Langley Research Center are discussed.

N79-23100# Army Aviation Research and Development Command, St. Louis Mo

STABILIZED TERRAIN OPTICAL POSITION SENSOR (STOPS) FLIGHT TEST REPORT

Christos M Tsoubanos Jan 1979 54 p refs (AD-AO65018, USAAVRADCOM-TR-79-1) Avail NTIS HC AO4/MF AO1 CSCL 01/3

This report presents the flight test results and evaluation of a brassboard model self-contained hover position sensor and obstacle clearing device. The brassboard model of the self-contained absolute, position sensor referred as Stabilized Terrain Optical Postion Sensor (STOPS) was successfully installed and flown on the Avionics Research and Development Activity's Experimental Vehicle for Avionics Research (EVAR) project helicopter. The results derived from the test indicate that position radial accuracies of better than 5 feet can be expected at constant (60 feet AGL) altitude. For mission maneuvers such as the bob-up and remask, designed for the AAH position radial errors are in the order of 10 to 20 feet.

N79-23101# AIResearch Mfg Co., Torrance Calif ELECTROMECHANICAL ACTUATION DEVELOPMENT Final Report, Feb 1976 - Sep 1978

Neal E Wood and Robert A Lewis Dec 1978 412 p (Contract F33615-76-C-3043)

(AD-A065734, AIResearch-78-15067 AFFDL-TR-78-150) Avail NTIS HC A18/MF A01 CSCL 01/3

Electromechanical actuation of primary flight control surfaces has been demonstrated by the development of an integrated rotary hinge-line dual-redundant actuation unit. The characteristics of the developed hardware closely correlate with the design predictions. A digital computer program was developed to simulate dynamic operation of the unit based upon the known equipment characteristics. The system simulation results showed that the electromechanical actuation unit can meet selected performance goals. Component compatibility system function performance capabilities and redundant operation were demonstrated using the laboratory hardware and computerized simulation analyses.

Author (GRA)

N79-23102# Air Force Human Resources Lab Wright-Patterson AFB Ohio

MOTION AND FORCE CUEING REQUIREMENTS AND TECHNIQUES FOR ADVANCED TACTICAL AIRCRAFT SIMULATION Final Report, Jul 1977 - Mar 1978

William B Albery Don R Gum and Gerald J Kron (Singer-Link Co. Binghamton N Y) Brooks AFB Tex Dec 1978 20 p

(AD-A064691 AFHRL-TR-78-73) Avail NTIS HC A02/MF A01 CSCL 01/3

The Air Force Human Resources Laboratory (AFHRL) has the responsibility for research and development of advanced simulation techniques including motion and force cueing requirements and techniques. This report is a summary of the efforts currently underway at AFHRL under Projects 6114 and 1958 which are directed at advanced tactical aircraft simulation The approach being pursued is two-fold the first part includes efforts directed towards building a data base for use in developing cueing requirements the second part includes efforts to improve the performance of existing devices that have been shown to be somewhat effective and to develop new devices and techniques as indicated by the data base efforts. Exploratory efforts including the development of a composite sensory model the design of high-g augmentation devices the development of a myoelectric feedback display dimming technique and the collection of g-cue environment data are discussed. An advanced development effort the advanced g-cueing system (including g-sdat g-suit, and seat shaker) is highlighted Author (GRA)

N79-23103# Army Aviation Engineering Flight Activity Edwards AFB Calif

FLIGHT EVALUATION MK 2 INTEGRATED CONTROLLER INSTALLED IN AN OH-58A HELICOPTER Final Report John F Hagen, Patrick J Moe, and Ralph Woratschek Apr 1978 66 p refs

(AD-A065072 USAAEFA-77-11) Avail HC A04/MF A01 CSCL 01/4 NTIS

This activity conducted a limited handling gralities and pilot workload evaluation of the MK II integrated controller installed in an OH-58A helicopter. The evaluation consisted of 22 flights for 15.2 hours of productive flight test time. The OH-58A could be safely flown throughout the recommended flight envelope using the integrated controller. The pilot workload when using the integrated controller with two hands was not reduced from and was sometimes greater than the workload when using conventional controls for all maneuvers except level forward flight Single hand control during flight and landing could be safely accomplished, but required increased pilot workload in all cases The two most serious unsatisfactory characteristics identified were lack of an adequate system-decoupled warning and excessive workload during left sideward flight between approximately 15 to 25 knots true airspeed. Three unsatisfactory characteristics that contributed to the increased workload when using the integrated controller were excessive longitudinal and lateral integrated controller response and sensitivity lack of control displacement harmony between the integrated controller cyclic and collective controls, and inadvertent cyclic control inputs with collective control movement. The reduced longitudinal and lateral control authority which limited the aircraft's forward flight capability at aft center of gravity rearward flight capability at forward center of gravity and slope landing capability was also an unsatisfactory characteristic Eight additional unsatisfactory characteristics were also identified

N79-23104# Societe Nationale Industrielle Aerospatiale Paris (France)

BUFFETING MEASUREMENTS IN FLIGHT AND IN A WIND TUNNEL (MESURES DE TREMBLEMENT EN VOL ET EN SOUFFLERIE)

C Havette and J Mandle Paris Assoc Aeron et Astronautique de France 1977 21 p refs in FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov 1977 Sponsored by Serv Tech de l Aeron Prepared jointly with ONERA Modane France

(AAAF-NT-78-17 ISBN-2-7170-0502-1) Avail NTIS HC A02/MF A01 CEDOCAR Paris FF 17 (France and EEC) FF 21 (others)

The buffeting effect on a 1 10 scale model in a wind tunnel was compared with in-flight measurements taken on a T-33 aircraft either with a standard NACA=65213a = 0.5 wing profile or an S17a wide supercritical profile in order to determine if real flight conditions can be estimated in wind tunnel tests. The model and aircraft were provided with several methods for buffeting measurement such as wall static pressure distribution Kulite-type pressure sensors adapted to unsteady measurements (four on the aircraft) wake exploration devices that permit comparison of profiles. Cx with those of two-dimensional tests accelerometers and flexometers. Preliminary results show that buffeting can be predicted from wind tunnel tests and that special analyses are similar for flight and wind tunnel conditions.

N79-23105# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

LARGE TRANSONIC WIND TUNNELS

1973 418 p refs Lecture held at Rhode-Saint-Genese Belgium 29 Jan 1973 - 2 Feb 1973

(VKI-Lecture-Series-52) Avail NTIS HC A18/MF A01

The design and construction of large transonic facilities are described with emphasis on wind tunnel drives, models test procedures and time requirements for measurements

N79-23106# Office National d'Etudes et de Recherches Aerospatiales Paris (France)

THE INJECTOR DRIVEN TUNNEL

Pierre Carriere In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 61 p refs

Avail NTIS HC A18/MF A01

Specific problems attached to an injector driven tunnel are examined with emphasis on (1) methods for evaluating and optimizing its performance in permanent regime (2) analysis of unsteady phenomena during the wind tunnel start and (3) problems of intense noise generated by the jets Some general indications are presented on the orders of magnitude of certain basic technological data. Section 8.4 of the LaWs Group final report. (January 1973) which summarizes the main proposals for the base features of the project of a transonic industrial IDT satisfying the LaWs Group specifications is included.

N79-23107# Institut Aerotechnique de Saint-Cyr-I Ecole (France)

HYDRAULIC COMPRESSOR FOR A WIND TUNNEL [SOUFFLERIE A COMPRESSEUR HYDRAULIQUE]

Maurice Menard In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 15 p refs In FRENCH

Avail NTIS HC A18/MF A01 .

The basic thermodynamic cycle for a wind tunnel drive is discussed and procedures for its installation in a transonic wind tunnel are described to illustrate both system operation and efficiency Technical solutions are presented for more economical construction of the projected apparatus and well as for the jet itself. Drawings are given for a 5 m x 4 20 wind tunnel.

Transi by ARH

N79-23108# Institut Aerotechnique de Saint-Cyr, Saint-Cyrl'Ecole (France)

THE PRIMING OF A WIND TUNNEL WITH A HYDRAULIC COMPRESSOR [ETUDE DE L'ANORCAGE D'UNE SOUFFLERIE A COMPRESSEUR HYDRAULIQUE]

Francis Chometon In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 10 p refs

Avail NTIS HC A18/MF A01

The more or less rapid opening of a valve to permit air entry into a wind tunnel causes an expansion wave which is propagated at the speed of sound and is reflected from the walls of the chamber back towards the water downstream from it is reflected back towards the walls of the upstream chamber until it is completely absorbed. The nature of these perturbations and means for reducing the intensity of these parasitic waves were investigated. Results of numerical calculations and experiments conducted to determine the influence of flow geometry are discussed.

N79-23109# Office National distudes et de Recherches Aerospatiales Toulouse (France)

EFFECTS OF FLOW TURBULENCE AND NOISE ON AERODYNAMIC PHENOMENA AND MEASURED QUANTITIES

R Michel $\mbox{\it In}$ Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 8 p refs In FRENCH

Avail NTIS HC A18/MF A01

The influence of different instabilities on wind tunnel flow are examined with emphasis on both supersonic and transonic boundary layer transition as well as the development of the turbulent boundary layer Implications for aerodynamic coefficients obtained in wind tunnel tests are discussed. Transl by A R H

N79-23110# Royal Aircraft Establishment Bedford (England) Aerodynamic Dept

THE DESIGN OF MODELS AND THEIR SUPPORTS, THE EVANS CLEAN-FLOW TUNNEL. A REVIEW OF SOME OF THE VARIOUS PROPOSALS

P G Pugh In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 51 p refs

Avail NTIS HC A11/MF A01

In the interests of economy a wind tunnel designer will favor increasing the pressure (rather than the size) as a means of attaining high Reynolds numbers. The implications of the strength and aeroelastic distortions of wind tunnel models and their supports on the design of high Reynolds number wind tunnels are examined. Operating principles are described for the

Evans clean flow tunnel in which the settling chamber of a conventional wind tunnel is extended as a long tube. Air is allowed to settle quietly in this tube before the start of a run during which it is pushed through the test section by a moving piston along the tube. Various experiments conducted to demonstrate its effectiveness are reviewed. Proposed drive systems for high Reynolds number transonic wind tunnels are examined.

N79-23111# ARO, Inc. Arnold Air Force Station, Tenn EXPERIMENTAL STUDIES IN A LUDWIEG TUBE TRAN-SONIC TUNNEL

C J Schueler (Von Karman Inst of Fluid Dynamics) In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 43 p refs Sponsored in part by USAF

Avail NTIS HC A18/MF A01

The feasibility of obtaining high Reynolds numbers in a transonic wind tunnel with a Ludweig tube drive system was investigated using a 1/13-scale model of a high Reynolds transonic facility. The studies conducted included measurement and analysis of (1) boundary layers in the charge tube (2) entrance to the nozzle and in the test section, (3) tunnel start time. (4) test section Mach number flow uniformity. (5) flow response time. (6) pressure distributions on a two-dimensional airfoil model. (7) force measurements on cones. (8) the influence of plenum volume, and (9) the acoustics of the exhaust system.

N79-23112# National Aerospace Lab Amsterdam (Netherlands) NOTES CONCERNING TESTING TIME REQUIREMENTS IN STEADY AND UNSTEADY MEASUREMENTS

J W G vanNunen /n Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 12 p

Avail NTIS HC A18/MF A01

Stationary wind tunnel measurements are needed to support theoretical calculations and to present information in cases where theory is expected to fail Among those there are effects at transonic speeds especially interaction between various large bodies and shock wave-boundary layer interaction influence of Reynolds number and separation of flow Information can be obtained in two ways either by overall force and moment measurements or by pressure measurements in both cases a model will in principle be sting-mounted to reduce the interference effects as much as possible Instationary pressure distribution induced by harmonic motions of the model are measured by pressure tubes or in situ transducers. Accelerometers mounted on the model measure its vibrational modes and are used to analyze flutter and and measure buffeting.

N79-23113# Avions Marcel Dassault-Breguet Aviation Saint-Cloud (France) Aerodynamics Dept WALL INTERFERENCE EFFECTS

Jean-Ch Vayssaire In Von Karman Inst for Fluid Dyn Large Transonic Wind Tunnels 1973 48 p refs

Avail NTIS HC A18/MF A01

A survey of the methods used to correct the wind tunnel model results for wall effect cannot be restricted to the study of the walls if the walls act on the model the wall action is affected by the general arrangement of the wind tunnel The shape of the section or the length of the test section are important parameters. When considering only aerodynamic criteria the following parameters must be positively known reference kinetic pressure reffered to as upstream pressure distribution of velocities and static pressures wind ascendance etc Furthermore air temperature shall be noted and relative humidity taken into account. Due allowance must be made for interactions caused by the supporting means i.e. struts or stings. These interactions are either direct in relation to the model or indirect due to the wall effect on the supporting means which acts in turn on the model Therefore the working section is considered to be affected by all the elements placed upstream or downstream ARH

N79-23114*# DCW Industries Studio City Calif
USER GUIDE FOR STRMLN A BOUNDARY-LAYER

PROGRAM FOR CONTOURED WIND-TUNNEL LINER DESIGN Final Report

E Clay Anderson May 1979 52 p refs (Contract NAS1-14517) (NASA-CR-159058 DCW-R-15-02) Avail HC A04/MF A01 CSCL 14B

A 2-D boundary layer computer code developed to process data for an arbitrary number of streamlines is presented. Provisions are included for the computer code to determine either mass transfer rates necessary for an effective boundary layer displacement of zero thickness or the effective displacement thickness for a specified mass transfer-rate distribution. The computer code was developed to be compatible with other computer codes which are being modified and/or developed at the NASA-Langley Research. Center in order to design the three dimensional contoured wind tunnel liner used in transonic testing of a laminar flow control system installed on a supercritical airfoil section. A brief discription of the liner design procedure representative liner calculations, adaptive-wall design for a two dimensional wind tunnel test, and other applications are reported.

N79-23115# San Diego Aircraft Engineering Inc Calif TEST PLAN FOR A ONE-HALF SCALE LABORATORY MODEL OF A RIGID SKIRT HOLD-DOWN SYSTEM Interim Report

P Sorensen 29 Sep 1978 21 p (Contract N62269-78-M-8646 WF41411000) (AD-A065171 SAE-78-027 NADC-79027-20)

(AD-A065171 SAE-78-027 NADC-79027-20) Avail NTIS HC A02/MF A01 CSCL 01/3

This report is a proposed test plan to obtain the data needed to project and evaluate the performance of a full scale system Key issues of the planned testing include air bearing seal leakage rates loss of hold-down force while traversing flight deck obstacles (tie-down fittings, door seals etc) and the magnitude of towing drag forces encountered during traversing In addition to the test plan, data requirements and test equipment/apparatus requirements are addressed GRA

N79-23116# Societe Bertin et Cie Villeurbanne (France) TWO DIMENSIONAL ANEMOMETRIC PROBE [NOUVELLE SONDE ANEMOMETRIQUE BIDIMENSIONNELLE]

M Lepretre Paris Assoc Aeron et Astronautique de France 1977 30 p refs in FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov 1977 (AAAF-NT-78-09, ISBN-2-7170-0494-7) Avail NTIS HC A03/MF A01 CEDOCAR, Paris FF 29 (France and EEC) FF 33 (others)

A cylindrical miniaturized anemometric probe having operational and cost advantages for measuring air velocity (intensity and direction) around a given point is described. It consists of a set of four steel tubes with lateral orifices immersed in a cylindrical resin block. The small probe can sense velocity direction from the differences between the four measuring devices and is mounted so that the cylinder axis is transversal to fluid flow Displacing the probe linearly a velocity diagram is obtained. This operation is repeated in different positions to construct a complete two-dimensional flow distribution pattern. Application examples and suggestions for improvement are discussed.

Author (ESA)

NTIS

N79-23117# Institut Franco-Allemand de Recherches, St Louis (France)

OPTICAL FLOW MEASUREMENTS APPLICATIONS TO WIND TUNNELS OR MOTOR BENCH TESTS [MEASURES OPTIQUES DANS LES ECOULEMENTS APPLICATION AU SOUFFLERIE OU AUX BANCS D'ESSAIS DE MOTEURS] X Bouis (ONERA) Paris Assoc Aeron et Astronautique de

X Bouis (ONERA) Paris Assoc Aeron et Astronautique de France 1977 57 p refs in FRENCH Presented at the 14th Colloq d Bdrondyn Appl Toulouse 7-9 Nov 1977 Prepared jointly with ONERA Modane France

(AAAF-NT-78-07 ISBN-2-7170-0492-0) Avail NTIS HC A04/MF A01, CEDOCAR Paris FF 29 (France and EEC) FF 33 (others)

The optical flow measuring methods surveyed include integral methods such as interferometry and spectroscopy and point methods, suc as laser anemometry, Raman effect and Rayleigh diffusion. The principle resolution in time and space

uses, and limitations are discussed for each method. It is concluded that point measurements are limited by signal level. Only laser anemometry using by far the strongest signals can reach a better than 1% precision on instant measurements. Integral methods are limited to two-dimensional flow. Cases of specific application of optical methods are reviewed.

Author (ESA)

N79-23118# Association Aeronautique et Astronautique de France Paris

EUROPEAN TRANSONIC WIND TUNNEL PROJECT FOR HIGH REYNOLDS NUMBERS [PROJECT DE SOUFFLERIE TRANSSONIQUE EUROPEENE A GRAND NOMBRE DE REYNOLDS]

J Christophe Nov 1977 34 p refs In FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov 1977 (AAAF-NT-78-01 ISBN-2-7170-0486) Avail NTIS HC A03/MF A01 CEDOCAR, Paris FF 29 (France and EEC) FF 33 (others)

Work from 1968 to the final joint recommendation to build a cryogenic transonic high Reynolds number wind tunnel for European governments is discussed. Such a project is necessary since actual flight performance differs from low Reynolds number transonic wind tunnel results. Several alternatives were proposed and experimentally tried in pilot essays. The cryogenic solution was finally recommended as static pressure and power can be kept low for the same Reynolds number. The proposed wind tunnel is 1.95 x 1.65 sq. m. with maximum pressure at 4.4 Bars minimum temperature at 120K. Mach number up to 1.35 and Reynolds number up to 4.0 million when working with nitrogen instead of air.

N79-23119# Association Aeronautique et Astronautique de France Paris

EFFECT OF THE MODEL VERTICAL POSITION IN A SLOTTED WALL WIND TUNNEL [EFFET DE LA POSITION EN HAUTEUR D'UNE MAQUETTE DANS UNE SOUFFLERIE A PAROIS PERMEABLES A FENTES]

C vandeKreeke (Aerospatiale) Nov 1977 24 p refs In FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov, 1977

(AAAF-NT-78-05 ISBN-2-7170-0490-4) Avail NTIS HC A02/MF A01 CEDOCAR Paris FF 17 (France and EEC) FF 21 (others)

The forces acting on a model in the vertical position in a slotted wall transonic wind tunnel were measured. This influence was measured at Mach 0.2 to 0.25 near the upper wall of the wind tunnel. Results show that wall effects are significant as the model is positioned further away from the flow axis. Tests for positions vertically departing from the flow axis are required as well as additional measurements to furnish the necessary corrections.

Author (ESA)

N79-23120# Association Aeronautique et Astronautique de France Paris

SIMILITUDE, MANUFACTURING, IDENTIFICATION, AND INSTRUMENTATION OF TEST MODELS [SIMILITUDE, REALIZATION, IDENTIFICATION, ET INSTRUMENTATION DES MAQUETTES D'ESSAIS]

F Dupriez (Univ des Sci et Tech de Lille) 1977 38 p refs In FRENCH Presented at the 14th Colloq d'Aerodyn Appl Toulouse 7-9 Nov 1977

(AAAF-NT-78-24 ISBN-2-7170-0509-9) Avail NTIS HC A03/MF A01 CEDOCAR Paris FF 29 (France and EEC) FF 33 (others)

Several aspects of present aircraft model technology are surveyed. Similitude and practical choice rules are discussed as well as identification and instrumentation techniques. Specifications and manufacturing are illustrated with several practical examples such as use of high technology composite materials (carbon and boron fibers) increasing application of numerical control manufacturing techniques the rapid development of microprocessor use and adaptation to basic technological changes such as cryogenic wind tunnels.

Author (ESA)

N79-23121# Avions Marcel Dassault-Breguet Aviation Saint-Cloud (France)

IMPROVEMENT OF THE AERODYNAMIC CIRCUIT IN THE BREGUET-VELIZY LOW SPEED WIND TUNNEL [MOD-ERNIZATION DE LA SOUFFLERIE BASSE VITESSE BREGUET DE VELIZY AMELIORATION DU CIRCUIT AERODYNAMIQUE]

C Couedor Paris Assoc Aeron et Astronautique de France 1977 24 p In FRENCH Presented at the 14th Colloq d Aerodyn Appl Toulouse 7-9 Nov 1977

(AAAF-NT-78-11 ISBN-2-7170-0496-3) NTIS Avail HC A02/MF A01 CEDOCAR Paris FF 17 (France and EEC) FF 21 (others)

In an Eiffel-type rectangular semi-guided (3 8 x 3 07m) wind tunnel, used normally at 37 m/s 30 modifications aimed at reducing macroturbulence problems were tested. A total of 400 combination tests were performed on a reduced scale and five devices were selected. The modification of the wind tunnel was carried out in January 76 Improvement of the aerodynamic circuit resulted in increased test reliability and precision

Author (ESA)

N79-23122# Association Aeronautique et Astronautique de France Paris

MODERNIZATION OF THE LOW SPEED WIND TUNNEL AT BREGUET DE VELIZY MEASURING SYSTEM MOD-ERNIZATION [MODERNISATION DE LA SOUFFLERIE BASSE VITESSE BREGUET DE VELIZY MODERNISATION DES MOYENS DE MESURE]

G Pierron Paris Assoc Aeron et Astronautique de France 1977 26 p refs in FRENCH Presented at the 14th Collog d Aerodyn Appl Toulouse 7-9 Nov 1977 ISBN-2-7170-0497-1) (AAAF-NT-78-12 Avail

HC A03/MF A01 CEDOCAR, Paris FF 17 (France and EEC) FF 21 (others)

To improve measuring precision and processing speed, a new system was developed based on the TI980A hardware and programming criteria are discussed Dispersion of data in the improved system is + or - 0 04% on drag coefficient measurements + or - 04% on lift and + or - 015% on roll for classic airplanes. The new processing and recording time is 4 to 5 min to obtain a polar analysis, 0 to 30 deg. Idle wind tunnel time because of measuring system failure was 4 days in 3 yrs working full time Author (ESA)

N79-23123# Laboratoire de Recherches Balistiques et Aerodynamiques Vernon (France)

IMPROVEMENTS ON THE C4/VERNON WIND TUNNEL [AMELIORATIONS DE LA SOUFFLERIE C4/VERNON]

Jean-Pierre Bernheim Paris Assoc Aeron et Astronautique de France 1977 34 p refs in FRENCH Presented at the 14th Colloq d Aerodyn Appl, Toulouse 7-9 Nov 1977 ISBN-2-7170-0498-x) (AAAF-NT-78-13 Avail

HC A03/MF A01 CEDOCAR Paris FF 29 (France and EEC) FF 33 (others)

Improvements were made to extend the range of applications to include transonic flow and to incorporate new measuring devices For transonics the flow section was reduced limiting the height to 350 mm including perforated walls. Pressure drop studies were made to determine the influence of model size and positivn on the permeability factor. Complementary improvements are programmed. Among the new measuring devices are three 6-component balances and one double beam balance to measure forces on a 20 mm wing model Feasibility of a magnus effect balance has been demonstrated and construction is in progress Author (ESA)

N79-23124# Association Aeronautique et Astronautique de

CONSTRUCTION PROBLEMS SPECIFIC TO MODELS FOR HIGH REYNOLDS NUMBER WIND TUNNELS [PROBLEMES DE CONSTRUCTION DE MAQUETTES POUR LES SOUF-FLERIES A GRAND NOMBRE DE REYNOLDS]

M Bazin 1977 45 p refs in FRENCH Presented at the 14th Collog d Aerodyn Appl Toulouse 7-9 Nov 1977 (AAAF-NT-78-02 ISBN-2-7170-0487-4) Avail NTIS

HC A03/MF A01 CEDOCAR Paris FF 29 (France and EEC) FF 33 (others)

The state-of-the-art is surveyed for both pressurized and cryogenic wind tunnel alternatives. Materials feasible dimensions saftey problems cost instrumentation etc are discussed by model construction experts Feasibility is demonstrated although an effort to reduce developing time is still necessary. Present limitations include balances and model supports. New methods or materials will be necessary to replace local gages in the Author (ESA) case of cryogenic systems

N79-23125# Bristol Univ (England) Dept of Aeronautical Engineering

THE EFFECT OF BLOCKAGE IN SHEAR FLOW IN THE WIND TUNNEL BS Thesis

P P Kirrane and S J Stewart Jun 1978 33 p refs (BU-221) Avail NTIS HC A03/MF A01

In an attempt to isolate and quantify the effects of blockage in shear flow, the pressure fields around two-dimensional Gaussian hills in an industrial wind tunnel were measured. The results obtained were compared with computed results for an unbounded turbulent shear flow. It was found that blockage errors were masked by limitations in the boundary layer simulation for blockages of less than 10 percent Author (ESA)

N79-23181# Purdue Univ , Lafayette, Ind School of Mechanical Engineering

IGNITION OF FUEL SPRAYS BY HOT SURFACES AND STABILIZATION OF AIRCRAFT FIRES Intenm Report, 1 Oct 1977 - 15 Nov. 1978

J G Skifstd, A H Lefebvre D R Ballal K R Sarsteder and M S Kelly Nov 1978 51 p refs (Grant AF-AFOSR-3446-77)

(AD-A065153, AFOSR-79-0079TR) NTIS HC A04/MF A01 CSCL 01/2

This first annual report discusses a research project undertaken to investigate experimentally and theoretically the ignition of fuel sprays by hot surfaces and the stabilization of aircraft fires related to aircraft fire safety. The basic problems are outlined and the experimental facilities developed for the research are described along with a discussion of operating experience to date

Author (GRA)

N79-23219# Naval Surface Weapons Center White Oak, Md POLYURETHANE FOAMS FOR AIRCRAFT SHOCK MOUNTS 2 POLYBUTADIENE BASED FOAMS Progress Report, Oct 1977 - Jun 1978

Hubert J Booth and James V Duffy Nov 1978 72 p refs (AD-A064859, NSWC/WOL/TR-78-162) Avail HC A04/MF A01 CSCL 11/9

The objective of this program was to develop flexible foam systems which meet the specifications outlined in MIL-F-81334B (AS) This report deals with the results obtained from a series of roams based on polybutadient polyol and its combinations with various types of polyether polyols. Polyol ratios surfactant type and concentration, and catalyst type and concentration were evaluated to determine their influence on foam properties. Those foams demonstrating the most promise were measured for density, compression set rebound tensile strength elongation hydraulic fluid and hydrolytic resistance porosity and vibration damping

Author (GRA)

N79-23227# Bristol Univ (England) Dept of Aeronautical Engineering

ANALYSIS OF THE MECHANICAL PROPERTIES OF RIGID FOAMS WITH PARTICULAR CONSIDERATION OF A RIGID POLYETHER STRUCTURAL FOAM BS Thesis

A J Beckett and P T Waller Jun 1978 74 p refs

(BU-229) Avail NTIS HC A04/MF A01

A preliminary investigation was made into the mechanical properties (tension compression shear torsion and two types of bending) of rigid structural foams with particular interest in rigid polyether foam. While seemingly accurate values of Young's modulus and shear modulus were obtained for each test there was considerable variation in values between the tests. Three principal values of Young's modulus were obtained. In tension tests the values gave a mean of 13.5 N/sq mm in compression a mean value of 20.8N/sq mm. The values of shear modulus obtained from the shear and torsion tests were both approximately 10.0 N/sq mm. While no theory could be found to relate the different values of Young's modulus the foam was thought to be isotropic Poisson's ratio was found to be 0.19 Author (ESA)

N79-23232# Department of Energy Bartlesville Okla Energy Research Center

THERMODYNAMICS OF ORGANIC COMPOUNDS Final Technical Summary Report, 1 Oct 1977 - 30 Sep 1978
William D Good Donald W Scott Norris K Smith Susan

William D Good Donald W Scott Norris K Smith Susan Lee-Bechtold and Ann G Osborn 30 Sep 1978 27 p refs (AFOSR-ISSA-78-0009)

(AD-A065664 AFOSR-79-0197TR) Avail NTIS HC A03/MF A01 CSCL 21/4

Both basic and applied research continued on the thermodynamic properties of currently used high energy fuels and of possible constituents of high energy fuels of the future. Enthalpies of combustion were measured for two ramjet fuels currently in use and differential scanning calorimetry evaluated heat capacities of four such fuels. Enthalpies of combustion were measured for two pure organic compounds having the energetic cyclobutane ring in their molecular structure and the study of compounds that may have higher combustion energies because of steric interaction of adjacent alkyl groups was continued with vapor pressure study on dialkylnaphthalene.

Author (GRA)

N79-23236# Advisory Group for Aerospace Research and Development Paris (France)

ADVANCED FABRICATION PROCESSES

Mar 1979 258 p refs In ENGLISH and FRENCH Presented at the 47th Meeting of AGARD Struct and Mater Panel, Florence, 26-28 Sep 1978

(AGARD-CP-256 ISBN-92-835-0227-2) Avail NTIS HC A12/MF A01

The purpose of the specialists meeting was threefold Most importantly it was to elucidate on some specific high payoff new processing concepts selected from a cross-section of NATO nations. This broad base of coverage was invaluable in itself but also was intended to aid in steering the Structures and Materials Panel toward selection of specific new areas where data and information interchange in much greater depth would be beneficial. The third purpose was to promote a coupling of the fundamental research activities to more applied efforts.

N79-23242# Royal Aircraft Establishment, Farnborough (England) Materials Dept

AN EVALUATION OF COATINGS FOR STEEL AND TITANIUM ALLOY FASTENERS FOR AIRCRAFT APPLICATIONS

V C R McLoughlin In AGARD Advan Fabric Processes Mar 1979 11 p refs

Copyright Avail NTIS HC A12/MF A01

To evaluate their use as alternatives to cadmium on bolts the properties of various coatings were examined Judged by marine atmosphere exposure the corrosion resistance of the coated bolts varied from excellent (cadmium and zinc plate) to negligible their galvanic compatibility with aluminium alloy showed similar variations. The results of laboratory tests to evaluate these corrosion characteristics conflicted with the marine atmosphere tests. The measurement of the currents generated and weight losses which occurred in galvanic cells between the bolts and aluminum alloy electrodes is shown to be a useful and very rapid screening test for galvanic compatibility. The uniformity of the coatings was established metallographically and various properties of the coatings examined include fluid resistance paint adhesion properties, electrical conductivity and resistance to thermal shock. The effect of the coatings on the fatigue properties and torque-tension characteristics of the bolts were also assessed

N79-23251# Rockwell International Corp Los Angeles Calif Advanced Titanium Technology Div

CONCURRENT SUPERPLASTIC FORMING/DIFFUSION BONDING OF B-1 COMPONENTS

George W Stacher and Edward D Weisert In AGARD Advan Fabric Processes Mar 1979 10 p refs

Avail NTIS HC A12/MF A01

A process that combines both superplastic forming and diffusion bonding of titanium is discussed. Trade studies using this technology in actual applications show that this combined process results in cost savings up to 60% when compared to conventional titanium construction methods while also saving weight. The evolution of these titanium fabrication methods came about because of the necessity to improve aircraft performance and reduce cost of ownership. Applications include single-sheet formed parts selectively formed and bonded hollow sections and complex sandwich structure replacing multiple-piece assemblies and machined parts. A total of 26 different titanium configurations were produced and installed on the B-1. Cost reductions and weight savings in all cases have averaged between 30 and 50% when compared to previous construction.

MMM

N79-23252# British Aerospace Aircraft Group Bristol (England) FABRICATION OF TITANIUM AT HIGH TEMPERATURES

S J Swadling /n AGARD Advan Fabric Processes Mai 1979 17 p

Avail NTIS HC A12/MF A01

Forming techniques of titanium and titanium alloys are presented. The applications of the technology in aircraft component manufacture is discussed. Cost estimates and production methods are given.

N79-23254# Fiat Research Center Orbassano (Italy) HEAT TREATMENT OF P/M NICKEL-BASE SUPERALLOYS FOR TURBINE DISKS

P L Antona and A Bennani In AGARD Advan Fabric Processes Mar 1979 20 p

Avail NTIS HC A12/MF A01

The microstructure of a superalloy produced from pre-alloyed powder using the hot isostatic pressing process is presented. This superalloy makes subsequent heat treatment simpler and enables mechanical characteristics to be obtained which are comparable with superalloys produced using conventional technologies.

M.M.M.

N79-23257*# National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

IDENTIFICATION AND DUAL ADAPTIVE CONTROL OF A TURBOJET ENGINE

Walter Merrill and Gary Leininger (Toledo Univ) 1979 10 p refs Proposed for presentation at the 5th IFAC Symp on Identification and System Parameter Estimation Darmstadt West Ger 24-28 Sep 1979

(NASA-TM-79145 E-10000) Avail NTIS HC A02/MF A01 CSCL 21E

The objective of this paper is to utilize the design methods of modern control theory to realize a dual-adaptive feedback control unit for a highly nonlinear single spool airbreathing turbojet engine. Using a very detailed and accurate simulation of the nonlinear engine as the data source linear operating point models of unspecified dimension are identified. Feedback control laws are designed at each operating point for a prespecified set of sampling rates using sampled-data output regulator theory. The control system sampling rate is determined by an adaptive sampling algorithm in correspondence with turbojet engine performance. The result is a dual-adaptive control law that is functionally dependent upon the sampling rate selected and environmental operating conditions. Simulation transients demonstrate the utility of the dual-adaptive design to improve on-board computer utilization while maintaining acceptable levels of engine performance

N79-23260# Army Construction Engineering Research Lab Champaign, III

SYSTEMS APPROACH TO LIFE-CYCLE DESIGN OF PAVEMENTS VOLUME 3 LIFE2 PROGRAM LISTING Final Report

Edward S Lindow Oct 1979 454 p refs (DA Proj 4A7-63734-DT-08)

NTIS (AD-A064698 CERL-TR-M-253-Vol-3)

HC A20/MF A01 CSCL 13/2

This report is the third volume of a three-volume report which documents an automated system (LIFE2) for analyzing pavement designs and maintenance and repair strategies based on life-cycle costs LIFE2 models existing Corps of Engineers criteria for designing rigid and flexible pavements for airfields, roads, and streets. The program includes analytical procedures for evaluating earthwork drainage and frost protection requirements in addition to maintenance costs. The resulting combinations of design schemes and maintenance strategies are ranked by total cost over the design life of the pavement. Volume I is the LIFE2 Users Manual Volume II is the LIFE2 System Documentation and Volume III is the LIFE2 Program Listing Author (GRA)

N79-23261# Naval Ship Research and Development Center Bethesda Md Ship Performance Dept

PERFORMANCE OF A TAP-2 HYDROFOIL

Pierre Lafrance Jun 1978 105 p refs (AD-A065102, DTNSRDC/SPD-0843-01) NTIS HC A06/MF A01 CSCL 13/10

This report discusses the measured performance of the TAP-2 hydrofoil, a mixed foil designed to operate fully wetted at takeoff (35 knots) and which through a change in geometry can fly fully ventilated at cruise speed (60 knots) At takeoff TAP-2 has a lift-to-drag ratio of 13 at the design lift coefficient, the corresponding figure for cruise speed is between 7 and 8 Predictive extrapolation to prototype scale is discussed and contrasted with our present understanding of the scaling laws associated with ventilation

N79-23318# Army Missile Research and Development Command Redstone Arsenal Ala Technology Lab

RADAR TRACK DATA CORRELATION OR REACHABLE SETS REVISITED THE REACHABLE STATE

Richard E Dickson 31 Jul 1978 31 p refs (AD-A065045 DRDMI-T-78-61)

Avail NTIS

HC A03/MF A01 CSCL 17/9

Given an aircraft's position and velocity at time t sub 0 and the limits on the rate at which the aircraft executes horizontal turns what is the set of all possible position at time t given the change in heading at time t and that the speed is unchanged Author (GRA)

N79-23331# Syracuse Univ N Y

STUDY OF RADC NEWPORT ANTENNA TEST RANGE METHODS OF REFLECTION REDUCTIONS AND IN-CREASED FREQUENCY COVERAGE

J Perini and B Silverman Jan 1979 71 p

(Contract F30602-75-C-0121)

(AD-A065151 RADC-TR-78-262) Avail NTIS

HC A04/MF A01 CSCL 14/2

In this report a study of the short and long antenna ranges at the RADC/NEWPORT site is undertaken with the objectives of extending its frequency of operation from 2 GHz down to 200 MHz and from 18 GHz up to 40 GHz In the report the problem of ground reflections is studied and two solutions are proposed A short term solution was that of constructing ground fences and a long term solution which consists of processing the signal received using digital signal processing techniques to eliminate the reflections. The ground fences have been constructed and the improvement is documented by measurements before and after the fences were installed. As for the digital signal processing a theoretical study is carried out A feasibility study of its implementation is recommended Instrumentation needs for the extension of the site frequency Author (GRA) range is also included in the report

N79-23378# Southampton Univ (England) Inst of Sound and Vibration Research

AERODYNAMIC NOISE THEORY

P A Lush In Von Karman Inst for Fluid Dyn Advan in Turbulent Shear Flows Mar 1973 34 p

Avail NTIS HC A20/MF A01

Lighthill's acoustic analogy is reviewed and an attempt is made to reformulate the source function so that the resulting noise estimates are relatively independent of a detailed knowledge of the flow field Expressions are developed for the far-field acoustic pressures due to the distributed arrays of fluctuation mass addition fluctuating forces, and fluctuating stresses Assuming that these casual effects occur in typical turbulent flows the observed properties of turbulent flows are used to investigate the parametric dependences of the noise fields generated. The estimated aerodynamic noise sources are then applied to jet flows Practical results show that theory grossly over-predicts high frequency noise particularly at high speeds and small angles to the jet axis and the peak frequency at these smaller angles is virtually independent of jet velocity rather than proportional to it as predicted by theory Causes of these discrepancies are suggested

N79-23379# Southampton Univ (England) Inst of Sound and Vibration Research

JET NOISE A STATUS REPORT
P A Lush In Von Karman Inst for Fluid Dyn Advan in Turbulent Shear Flows Mar 1973 26 p refs

Avail NTIS HC A20/MF A01

Major investigations were conducted in a recently constructed jet noise facility to measure the noise produced by the turbulent mixing of gases downstream of the nozzle exit plane, the additional noise arising from the presence of shock waves in the jet exhairst, and the excess tailpipe noise arising either from within the engine or generated at the nozzle exit plane because of engine promoted flow disturbances. Specific attention was given to (1) the cold subsonic jet (2) the effects of jet temperature (3) the overall levels and spectral characteristics of shock associated noise and (4) excess noise possibly generated by a highly turbulent exit

N79-23425# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

TRANSONIC FLOWS IN TURBOMACHINERY VOLUME 1 THEORY, PART 2

1973 182 p refs Lecture held at Rhode-Saint-Genese Belgium, 21-25 May 1973

(VKI-Lecture-Series-59-1-Pt-2) Avail NTIS HC A09/MF A01 The topics discussed include confluence of two supersonic

jets at the trailing edge of transonic turbine blades, phock boundary layer interaction in transonic and supersonic floy and shock boundary layer interaction in compressor cascades

N79-23426# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

THE CONFLUENCE OF TWO SUPERSONIC JETS AT THE TRAILING EDGE OF TRANSONIC TURBINE BLADES

C Sieverding In its Transonic Flows in Turbomachinery Vol 1 Theory Pt 2 1973 19 p refs

Avail NTIS HC A09/MF A01

Solutions to the problem of confluence in supersonic flow at the trailing edge of a blade are discussed and include development of shock patterns in transonic turbine cascades and base pressure and static pressure calculations

N79-23428# Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)

SHOCK-BOUNDARY LAYER INTERACTION IN COMPRES-SOR CASCADES A REVIEW OF AVAILABLE DATA

J Chauvin In its Transonic Flows in Turbomachinery Vol 1 Theory, Pt 2 1973 14 p refs

Avail NTIS HC A09/MF A01

The correlations of Fottner Starken and Griepentrog are reviewed and compared The different types of interactions are discussed SES

N79-23431*# National Aeronautics and Space Administration Pasadena Office Calif

CENTRIFUGAL-RECIPROCATING COMPRESSOR Patent Application

Walter H Higa inventor (to NASA) (JPL) Filed 8 May 1979 24 p Sponsored by NASA

(Contract NAS7-100)

(NASA-Case-NPO-14597-1 US-Patent-Appl-SN-037194) Avail NTIS HC A02/MF A01 CSCL 13I

A centrifugal compressor is presented which includes at least a pair of cylinders arranged in coaxial alignment and supported for angular displacement about a common axis of rotation normally bisecting a common longitudinal axis of symmetry for the cylinders. The cylinders are characterized by ported closures located at the mutually rer ote ends thereof though which the cylinders are charged and discharged and a pair of piston heads seated within the cylinders and supported for floating displacement in compressive strokes in response to unidirectional angular displacement imparted to the cylinders.

N79-23450# Royal Netherlands Aircraft Factories Fokker Schiphol-Oost Technological Centre

OPERATIONAL EXPERIENCE WITH ADHESIVE BONDED STRUCTURES

Rob J Schliekelmann In AGARD Bonded Joints and Preparation for Bonding Mar 1979 30 p refs

Avail NTIS HC A14/MF A01

A survey is given of the operational experience with adhesive bonded structures in military and civil aircraft. In view of the widely different qualifications of these experiences, from highly favourable' through 'very unfavourable' an introduction is given to the various problem areas that caused service troubles. The objective is to develop full understanding of the principle causes of possible failures and to define ways and means to achieve fully reliable bonded joints that will play in the future an even more important role than today.

N79-23453# General Dynamics/Fort Worth Tex Materials Research Lab

BEHAVIOR OF ADHESIVELY BONDED JOINTS UNDER CYCLIC LOADING

John Romanko In AGARD Bonded Joints and Preparation for Bonding Mar 1979 42 p refs

Avail NTIS HC A14/MF A01

The state of the art in determining the fundamental mechanisms of fatigue degradation in structural adhesive joints and in identifying the dominant fatigue mechanisms with the service environmental regimes including cyclic mechanical loads temperature and humidity is presented. The scope involves an in-depth assessment of fatigue mechanisms and failure modes primarily in adhesively bonded metal/metal joints over the range of loads and environmental conditions experienced by modern high performance aircraft. Analytical and experimental stress analysis methods are described. The joints are analyzed to describe the stress/strain distributions developed within the adhesive interlayer by load/environmental fatigue conditions. Joint fatigue to various stages of joint life are examined for degradation mechanisms. The development of methodology for predicting the necessary service life of adhesively bonded joints is outlined.

N79-23454# Douglas Aircraft Co Inc., Long Beach Calif FAILURES IN ADHESIVELY BONDED STRUCTURES

Edward W Thrall Jr In AGARD Bonded Joints and Preparation for Bonding Mar 1979 89 p refs

(AF Proj 486U)

Avail NTIS HC A14/MF A01

The Primary Adhesively Bonded Structure Technology (PABST) program was undertaken to validate the bonded joint with tests and analyses. The program structural tests conducted to compare the strength of bonded joints to the classical riveted design are presented. The tests were conducted to determine allowables for static fatigue and damage tolerance (crack growth). Also presented are the analytical methods for predicting the bond line strength characteristics. The analyses were found to match the test results.

N79-23455# Institut fuer Angewandte Materialforschung der Fraunhoffer-Gesellschaft e V, Bremen (West Germany)

THE NATURE OF ADHESION MECHANISMS AND THE INFLUENCE OF SURFACE TREATMENTS ON THE BEHAVIOUR OF BONDED JOINTS

Walter Brockmann In AGARD Bonded Joints and Preparation for Bonding Mar 1979 23 p refs

Avail NTIS HC A14/MF A01

The following topics are discussed (1) physical chemical and mechanical bonding mechanisms (2) surface treatment and bonding durability and (3) techniques for surface properties G Y

N79-23537# Association Aeronautique et Astronautique de France Paris

ADAPTATION FOR THE ECONOMY OR ADAPTATION FOR ENERGY CONSERVATION [ADAPTATION POUR L'ECONOMIE OU ADAPTION POUR L'ECONOMIE D'ENERGIE]

P Lecomte 1977 44 p refs In FRENCH Presented at the 13th Intern Aeron Congr , Paris, 2-3 Jun 1977 (AAAF-NT-77-23, ISBN-2-7170-0448-3) Avail NTIS

HC A03/MF A01, CEDOCAR Paris FF 25 (France and EEC) FF 29 (others)

Text from an opening lecture at the Paris Aeronautical Internation Congress, June 1977 is presented. The central argument is that optimization of aircraft design can not be based only on energy conservation, other factors being important Several graphs are given referring to various technical and economical situations. The conclusions are that sound aircraft design must take into account factors or market competitivity and passenger's preferences and that some logical energy conserving ideas are, for instance modern turboprop for mach 0.6/0.7 short/medium distances straight wing jet for mach 0.75, innovation either in systems or structure, permitting weight reduction, and optimization of air traffic for minimal energy expenditure.

N79-23595# Air Force Geophysics Lab Hanscom AFB, Mass A MODERN THERMO-KINETIC WARM FOG DISPERSAL SYSTEM Final Report

Bruce A Kunkel 14 Nov 1978 29 p refs (AF Proj 2093)

(AD-A064428 AFGL-TR-78-0278 AFGL-AFSG-402) Avail NTIS HC A03/MF A01 CSCL 04/2

An extensive investigation has been made to arrive at optimum specifications for a thermo-kinetic warm fog dispersal system. This study included passive heat tests sub-scale heat/momentum tests and tests with a single full-scale runway combustor and an approach zone combustor. These tests were augmented with extensive analytical modeling of buoyant jets under coflowing and counterflowing wind conditions. The landing category and the operational requirements within each category are the primary factors affecting the size of the thermal fog dispersal system (TFDS). A Cat 2 TFDS employs 22 percent fewer combustors and uses 50 percent less fuel than a Cat 1 TFDS. The combustor specification and orientation are presented for both Cat 1 and Cat 2 systems.

N79-23604# Aeronautical Systems Div Wright-Patterson AFB Ohio

THUNDERSTORM TURBULENCE INVESTIGATIONS FOR 1973-1974 IN SUPPORT OF THE NATIONAL SEVERE STORMS LABORATORY (NSSL) Final Report, May - Jun 1973 and Apr - Jun 1974

Larry A Roberts Dec 1978 33 p

(AD-A065943 ASD-TR-78-1) Avail NTIS HC A03/MF A01 CSCL 04/2

During May and June of 1973 the 4950th Test Wing supplied an F-100F Thunderstorm Penetration aircraft to take turbulence measurements in support of a National Severe Storms Laboratory Program designed to evaluate Doppler radar as a means of detecting and quantifying turbulencd areas and intensities within severe storms. The tests were flown out of Tinker AFB. Oklahoma. The program was continued the following year during the Oklahoma thunderstorm season April-June 1974 For the second year an RF-4C was used as a penetration aircraft. This report presents the vertical wind and derived gust velocity experience accumulated during these two seasons and correlates them with statistical parameters radar reflectivity gradient of radar relectivity etc. An attempt is made to determine if variations of the correlation coefficients relating these various quantities exhibits a trend as altitude is increased or decreased. The results are not conclu-Author (GRA)

N79-23681# Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering

A STUDY OF EMBEDDED COMPUTER SYSTEM SOFTWARE ACQUISITION MANAGEMENT AND RECOMMENDATIONS TO IMPROVE DEVELOPMENT VISIBILITY MS Thesis

Gary M Barbee Sep 1978 107 p refs (AD-A065879, AFIT/GSM/SM/78S-1) Avail NTIS HC A06/MF A01 CSCL 09/2

The United States Air Force is the largest user of computers in the world and a major portion of that information processing capability is comprised of digital avionics computers. This thesis describes some of the major problems of acquiring Embedded Computer System (ECS) software for avionics systems A description of the DOD avionics software acquisition process is included for background information as well as a discussion of the applicable guidance policies and regulations. Recommendations to improve software acquisition were derived from literature research refined by interviews with practicing software engineers and managers and presented as a product of this thesis. The interviews were conducted with software acquisition personnel at the Aeronautical Systems Division of Air Force Systems Command at Wright-Patterson AFB, Ohio A major conclusion of this thesis is that the development of a computer software management discipline is both necessary and feasible

Author (GRA)

N79-23683# General Electric Co Daytona Beach Fla Space

SYSTEM DESCRIPTION AVIATION WIDE-ANGLE VISUAL SYSTEM (AWAVS) COMPUTER IMAGE GENERATOR (CIG) VISUAL SYSTEM Final Report

D V Morland Feb 1979 84 p refs (Contract N61339-76-C-0048)

(AD-A065060 NAVTRAEQUIPC-76-C-0048-1) Avail NTIS HC A05/MF A01 CSCL 09/2

This report provides an overall description of the Aviation Wide Angle Visual System (AWAVS) Computer Image Generator (CIG) System installed at the Naval Training Equipment Center in Orlando Florida The report includes descriptions of system functions and capabilities system hardware and new technology features incorporated in the CIG System design. Author (GRA)

N79-23754*# National Aeronautics and Space Administration Langley Research Center Hampton Va PHYSICAL AND SUBJECTIVE STUDIES OF AIRCRAFT

INTERIOR NOISE AND VIBRATION
David G Stephens and Jack D Leatherwood Apr 1979 16 p
refs To be presented at Symp on Internal Noise in Helicopters
Southampton England 17-20 Jul 1979

(NASA-TM-80084) Avail NTIS HC A02/MF A01 CSCL 20A Measurements to define and quantify the interior noise and vibration stimuli of aircraft are reviewed as well as field and simulation studies to determine the subjective response to such stimuli and theoretical and experimental studies to predict and control the interior environment. In addition, ride quality criteria/standards for noise vibration and combinations of these stimuli are discussed in relation to the helicopter cabin environment Data on passenger response are presented to illustrate the effects of interior noise and vibration on speech intelligibility and comfort of crew and passengers. The interactive effects of noise with multifrequency and multiaxis vibration are illustrated by data from LaRC ride quality simulator. Constant comfort contours for various combinations of noise and vibration are presented and the incorporation of these results into a useroriented model are discussed. With respect to aircraft interior noise and vibration control ongoing studies to define the near-field noise the transmission of noise through the structure and the effectiveness of control treatments are described

N79-23885# Office of Naval Research London (England) EUROPEAN SCIENTIFIC NOTES, VOLUME 32, NUMBER 5 Aubrey W Pryce ed and Victoria S Hewitson ed May 1978 42 p (AD-A065400 ESN-32-5) Avail NTIS HC A03/MF A01 CSCL 05/2

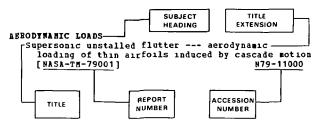
Contents Balloons Are Still Fashionable in France, More on Space from British Aerospace Company, Making Decisions on Nuclear Energy--British Ways Unintended Jamming Copper Alloys in the Marine Environment, Doing More with Less with Surface Coatings, Mehr Licht Mehr Licht -- Semiconductor Luminescence Research at Philips Physicits Tackle Organic Solids at the University of Stuttgart Stability Studies at the Universidad Autonoma de Madrid Fluid Mechanics at the Escuela Tecnica Superior de Ingenieros Industriales de Tarrasa Laser Sounding in the Stratosphere at Appleton Laboratory Human Factors and the Fighter Aircraft Cockpit of the 1990s and How Pilots Are Selected in West Germany GRA

SUBJECT INDEX

AERONAUTICAL ENGINEERING / A Continuing Bibliography (Suppl 112)

AUGUST 1979

Typical Subject Index Listing



The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, a title extension is added separated from the title by three hyphens. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

A	
A-300 AIRCRAPT	
Effect of the model vertical position in a	slotted
wall wind tunnel	
[AAAF-NT-78-05]	N79-23119
ABLATION	_
Laser balancing demonstration on a high-spe	eed
flexible rotor	A79-32351
[ASHE PAPER 79-GT-56] ACCURACY	A/9-32351
Pactors affecting omega accuracy	
[NDRE-71]	N79-22069
ACTUATORS	
Advanced flight control actuation system	
(AFCAS-E/P): Feasibility investigation of	of an
electro/pneumatic dual power driven conce	
[AD-A063992]	N79-22114
Electromechanical actuation development	N79-23101
[AD-A065734] ADAPTIVE CONTROL	N / 9- 23 TO T
Investigation of the Multiple Method Adapt:	ve.
Control (MMAC) method for flight control	
[NASA-CR-3089]	N79-23099
Identification and dual adaptive control of	ŧ a
turbojet engine	
[NASA-TM-79145]	N79-23257
ADBESION TESTS	
Pailures in adhesively bonded structures	N79-23454
ADHESIVE BONDING	N /3-23434
Operational experience with adhesive bonded	ì
structures	•
	N79-23450
Behavior of adhesively bonded joints under	cyclic
loading	•
	N79-23453
Pailures in adhesively bonded structures	
=1	N79-23454
The nature of adhesion mechanisms and the influence of surface treatments on the be	
of bonded joints	Staviour
or conded joines	N79-23455
AEROACOUSTICS	1177 25455
Peak Strouhal frequency of subsonic jet noi	se as a
function of Reynolds number	
-	A79-34537
Asymmetry of a circular jet observed in nea	r and
far fields low Re turbulence and acou	stic
characteristics	A79-34539
	8/3-34339

	Relatio	on betw	reen sta	tic and	ın-flıght	
	direc	t171t1	les of j	et nois	e	
						A79-34585
	Light [broberi	ler airc	raft no	ıse	A79-34980
1DI	ORVERN	C C015	ACTERIS	TTCC		A79-34980
801					tics of sma	ll aircraft
	gas t	urbine	s and A	PU's	0200 02 020	
	FASHI	PAPER	s and A	951		A79-32371
	The inf	fluence	e of the	bladın	g surface r	oughness on
	the a	aerodyr	namıc be	havior	and charact	eristic of
	an az	rial co	mpresso	E		
	[ASH	PAPER	79-GT-	102]		A79-32378
	TmbroAl	ing tur	Dine er	r dae t	y aerod urbine engi	Angmic and
	FASMI	S DYDER	79-GT-	1761	urbine engi	A79-32436
	Compute	er-aide	ed desig	n - Aer	odynamics	200 02 000
					•	A79-33456
					ds compared	
	wind-	-tunnel	land ma	themati	cal simulat	
					-e	A79-34595
	An expl	lorator	y inves	tigatio	n or quasi-	free flying
	Boder	is ill a	supers	onic sn	ort-duratio	n wind tunnel A79-35925
	A speci	al ext	ension	of the	General Poi	
	Perfo	rmance	Equati	on	for flight	paths
			•		,	A79-35926
	Predict	on of	aerody	namıc c	haracterist	ics for
	slend	der pod	lies alo	ne and	with liftin	g surfaces
	to hi	igh ang	les of	attack		w70 00000
	Penoran	onto 1	invects	ant non	of three he	N79-22023
						in the
						h transonic
		tunnel			.	
	[NASI	4-TP-13	396]			N79-22037
	yerodai	namic c	characte	ristics	of the clo	se-coupled
					to-moderate	swept
				General	trends	N70.22057
		1063819		1 D COO	led turbine	N79-22057
	desid	n for	small o	as turb	ine	Didding
		,	,			N79-22091
	The aer	odynan	ics and	perfor	mance chara	cteristics
	of di	rect 1	ift sch	emes		
				.		N79-23004
					e character	istics of
	wing	III d	шушента	tion sc	цешеѕ	N79-23006
	Aerodvi	amic c	haracte	ristics	at Mach nu	
	1.5,	1.8, a	nd 2.0	of a bl	ended wing-	body
	conf1	guratı	on with	and wi	thout integ	body ral canards
	(NASA	-TP-14	27]			ม79-23013
	The eff	ect of	surfac	e imper	fections on	the
	aerod	ynamic	perior	mance o	f an airfoi	ı at
	BU-2		ynolds	numbers		N79-23048
	Experim	ental	studies	in a L	udwieg tube	
	tunne	1	0044200			
						N79-23111
AEB	ODYBABI	C COBP	PICIENT	S		
	Aerodyn	amic a	nd aero	elastıc	characteri	stics of
	oscil	lating	loaded	cascad	es at low M	aca number
	HOERI	force	20d 01+	chapa m	oment of wi	A79-32387
	COMPI	nation	s in th	e nonli	near angle-	of-attack
			bsonic			
						N79-22022
ABB			IGURATI			
	Opt1 8 12	ation	of hype	rsonic	three-dimen	sional shapes
	***	A	5	4 n b n / n = :	némana	A79-35584
					rirame inte raft concep	gration for
	a hos	stal	- III	CL GILL	тат сопсер	N79-22027

AERODYBANIC FORCES SUBJECT INDEX

ABRODYNAMIC FORCES The time-variant aerodynamic response of a stator	Dynamic stability of a flight vehicle laying out an uncoiling line
row including the effects of airfoil camber	A79-32919
[ASME PAPER 79-GT-110] A79-32385 Aerodynamic and aeroelastic characteristics of	Time-variant aerodynamics of oscillating airfoil surfaces in a supersonic flowfield
oscillating loaded cascades at low Mach number.	A79-34531
I - Pressure distribution, forces, and moments [ASME PAPER 79-GT-111] A79-32386	ABBODYNAMIC STALLING Unsteady effects on a stalled wing in pulsed flow
Aerodynamic effects simulator for testing aircraft escape systems	- Comparison with back-and-forth oscillating case
A79-33617	Retreating blade and dynamic stall for
AERODYNAMIC INTERPERENCE Calibration of the AEDC-PWT 16-foot transonic	helicopter rotors A79-32294
tunnel aerodynamic test section at various	Aerodynamic characteristics of a fighter-type
Reynolds numbers	configuration during and beyond stall
[AD-A065112] N79-22117	N79-22003
ARRODYNAMIC LOADS Review of problems of unsteady aerodynamics of	Studies of the dynamic stall or airfoil profiles for helicopter rotors
helicopters	[AD-A065106] N79-23071
A79-32293	ABRODYBAHICS
Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach number	Aerodynamic design of fixed and variable geometry nozzleless turbine casings
[ASHE PAPER 79-GT-112] A79-32387	[ASME PAPER GT-87] A79-32364
Prediction of lateral aerodynamic loads on	A finite element approach to subsonic aerodynamics
aircraft at high angles of attack N79-22024	A79-35777
Prediction and measurement of the aerodynamic	Extended analytical study of the free-wing/free-trimmer concept
forces and pressure distributions of wing-tail	[NASA-CR-3135] N79-22040
configurations at very high angles of attack	Aerodynamic design and analysis of the AST-200
N79~22025 Bumblebee Program: Aerodynamic data. Part 4:	supersonic transport configuration concept [NASA-CR-159051] N79-22046
Wing loads at Mach numbers 1.5 and 2.0	Computer program to calculate three-dimensional
missile configurations	boundary layer flows over wings with wall mass
[NASA-CR-3117] N79-22041 The influence of sweep on the aerodynamic loading	transfer [NASA-CR-3123] N79-23016
of an oscillating NACA 0012 airfoil. Volume 1:	A brief review of air flight weapons
Technical report	N79-23051
[NASA-CR-3092] N79-22052 Predesign of the second-generation comprehensive	Aerodynamics of low aspect ratio wings N79-23053
helicopter analysis system	AEROELASTICITY
[AD-A064131] N79-22083	Study of compressor aeroelastic instabilities in a
Predesign of the second generation comprehensive	linear cascade wind tunnel
helicopter analysis system [AD-A064289] N79-22084	[ONERA, TP NO. 1979-6] A79-32296 Aerodynamic and aeroelastic characteristics of
Comparison of store trajectory and aerodynamic	oscillating loaded cascades at low Mach number.
loads, and model flow-field characteristics	I - Pressure distribution, forces, and moments
obtained in the AEDC PWT/4T and VFK/A wind tunnels at Mach number 1.63	[ASME PAPER 79-GT-111] A79-32386 Evaluation of the aerodynamic damping of the
[AD-A065137] N79-23017	oscillations of turbine blades with a view to
Large transonic wind tunnels [VKI-LECTURE-SERIES-52] N79-23105	pitch, stagger angle, and curvature of blades
[VKI-LECTURE-SERIES-52] N79-23105 AERODYNAMIC BOISE	A79-32828 Predesign of the second generation comprehensive
Peak Strouhal frequency of subsonic jet noise as a	helicopter analysis system
function of Reynolds number	[AD-A064289] N79-22084
A79~34537 Asymmetry of a circular jet observed in near and	ABROSPACE EBGIBERIEG Global services systems - Space communication
far fields low Re turbulence and acoustic	[AIAA 79-0946] A79-34761
characteristics	Advanced fabrication processes
A79-34539 Effects of flow turbulence and noise on	[AGARD-CP-256] N79-23236 European scientific notes, volume 32, number 5
aerodynamic phenomena and measured quantities	[AD-A065400] N79-23885
wind tunnel tests and boundary layer transition	ABBOTHERMODYBANICS On some methods for the numerical simulation of
N79~23109	flows with complex structure
Aerodynamic noise theory lighthill method,	A79-34691
turbulent flow, sound pressure, and wave equations	AFTERBODIES
N79~23378 Jet noise: A status report jet mixing and	Afterbody tests in the Modane hot gas bench [ABAF-NT-78-10] N79-23095
shock noise studies	APTERBURBING
N79-23379	Lo-frequency augmentor instability study
ARRODYNAMIC STABILITY Recent progress in active controls applied to	[AD-A065144] N79-22104 AGRICULTURE
flutter suppressors	Identification of high payoff research for more
A79~32277	efficient applicator helicopters in agriculture
Aircraft response to lateral gusts- Exploratory study	and forestry [NASA-CR-152258] N79-22076
179~32278	AILBROBS
Review of problems of unsteady aerodynamics of	Economical processing of fiber-reinforced
helicopters	components with thermal expansion molding CPRP structures for aircraft aileron
A79-32293 Some experimental results connected with the	[DGLR PAPER 79-011] A79-32307
transonic instabilities on an airfoil	A method for the optimal layout of driving
A79-32671	mechanisms of the aileron for gliders and
Evaluation of the aerodynamic damping of the oscillations of turbine blades with a view to	motorplanes A79-35921
pitch, stagger angle, and curvature of blades	AIR CARGO
A79-32828	Very Large Vehicle Conference, Arlington, Va., April 26, 27, 1979, Technical Papers
	A79-33827

SUBJECT INDEX AIRCRAFT DESIGN

Demand for large freighter aircraft as pro by the NASA cargo/logistics airlift syste		An analysis of long and medium-haul air pa demand, volume 1	-
studies [AIAA 79-0842]	A79-33829	[NASA-CR-152156] An analysis of short haul air passenger de	N79-22062 mand,
Concept for a large multi-mission amphibia: [AIAA 79-0849]	n aircraft A79-33832	volume 2 [NASA-CR-152157]	N79-22063
CH-47 helicopter internal cargo load and re		The impact of changing technology on the d	
system mock-up study [AD-A064207]	N79-22081	for air transportation [NASA-CR-152191]	N79-22065
AIR COMDITIONING A research study into the reliability of vo	arious	AIRBORNE EQUIPMENT Detection of CAT and low altitude wind she	ar by
fuel, hydraulic and air conditioning com of military aircraft		on-board aircraft IR sensors - An update	
ATD COOK THE	A79-33459	Bultichannel infrared receiver performance	
AIR COOLING Account of film turbulence for predicting:	film	airborne detection of antiaircraft missi	165 179-35210
cooling effectiveness in gas turbine com	bustors	AIRCRAPT ACCIDENT INVESTIGATION	a
[ASME PAPER 79-GT-200] Aerodynamic problems in cooled turbine black	A79-32457 ding	<pre>Mechanism of extremity injuries occurring ejection from P-4 aircraft</pre>	auring
design for small gas turbine	-	-	A79-33610
AIR FILTERS	N79-22091	AIRCRAPT ACCIDENTS Anatomy of an aircraft accident	
The trajectories of spherical particles in	flow		A79-33644
through cascaded turning vanes [BU-220]	N79-23096	Source of released carbon fibers	N79-22200
AIR PLOW	N75-25090	An assessment of local risk to area as	
A low cost, on-site performance monitoring thermodynamics of shaft power gas tu [ASME PAPER 79-GI-21]		with commercial operations of aircraft w graphite fiber composite structures	1th N79-22207
AIR INTAKES		AIRCRAFT ANTENNAS	
Visualisations and calculations of air into high angles of attack and low Reynolds in Navier-Stokes equation		Experimental analysis of V.H.P. antennas f helicopter homing systems using scale-mo techniques	
-	N79-22030	<u>-</u>	A79-34392
The injector driven tunnel	N79-23106	Study of RADC newport antenna test range: of reflection reductions and increased f	
AIR BAVIGATION	1175 25100	coverage	requescy
Geodesy and coordinate conversion for posi-	tion	[AD-A065151]	N79-23331
determination of aircraft	A79-32581	AIRCHAFT CARRIERS Airline productivity redefined - An analys	ıs of
Air France's Paris-Tokyo transpolar flight	ın 1978 A79-32583	U.S. and European carriers	A79-35100
AIR POLLUTION		AIRCRAFT COMPARTMENTS	
Characteristic time correlations of polluta emissions from an annular gas turbine cor		Physical and subjective studies of aircraf interior noise and vibration	τ
of aircraft engines		[NASA-TM-80084]	N79-23754
[ASME PAPER 79-GT-194] Effect of primary-zone equivalence ratio of	A79-32452	AIRCRAFT CONFIGURATIONS Propulsion system considerations for the s	ubsonic
pollutant formation		V/STOL	
[NASA-TP-1463] AIR SAMPLING	N79-23086	[ASME PAPER 78-GT-57] Surface pressure data for a supersonic-cru	A79-32934
Measurement of ozone in an aircraft		airplane configuration at Mach numbers o	
170 MA 170 DODGETTUC	A79-34925	2.96, 3.30	N70 220E1
AIR TO AIR REFUBLING Advanced Simulator for Pilot Training (ASP)	T):	[HASA-TM-80061] AIRCRAPT CONSTRUCTION NATERIALS	N79-22051
Aerial refueling visual simulation-engine		Economical processing of fiber-reinforced	
[AD-A063283] AIR TO SURFACE MISSILES	N79-22118	components with thermal expansion moldin CPRP structures for aircraft aileron	g
Unique crew escape concepts for ATS mission		[DGLE PAPES 79-011]	A79-32307
AIR TRAFFIC	179-33636	Gust spectrum fatigue crack propagation in candidate skin materials	
Traffic background level and signal duration	on	Candidate Skin maccinato	A79-33201
effects on aircraft noise judgment	A79-34580	Dynamic behavior of aircraft materials [AD-A064592]	N79-22078
AIR TRAFFIC CONTROL	A79-34360	Analysis of the mechanical properties of r	
Measuring and improving ATC capacity		foams with particular consideration of a	
The principle and practice of 'clutch' rada	A79-33024	polyether structural foam [BU-229]	N79-23227
operation		AIRCRAFT CONTROL	
Conflict alert for the air traffic control	A79-33025 system A79-33605	Semiautomatic control of aircraft: Systems manual aircraft control Russian book	
Beacon-based collision avoidance system -	879-33003	Parametric analysis of stereometric tracke	
Experimental results	170-22606	use in tactical aircraft	
Pactors in evaluating the effectiveness of	A79-33606 a	[AD-A064688] Active control transport design criteria	N79-22086
collision avoidance logic		[PAPER-6663]	N79-23065
Threat logic for air-derived CAS Collis	A79-33607 sion	<pre>Filtering technique based on high-frequenc modeling for high-gain control [NASA-CASE-LAR-12215-1]</pre>	y plant N79-23097
Piotreme olocem	A79-33608	AIRCRAFT DESIGN	MIS 23031
Radar track data correlation or reachable s		Designing aircraft shock absorbers	170-30505
revisited: The reachable state [AD-A065045]	N79-23318	Computer-aided design - Aerodynamics	A79-32585
AIR TRANSPORTATION		•	A79-33456
Airline productivity redefined - An analysi U.S. and European carriers	LS Of	Some observations on the local instability orthotropic structural sections	ot
tene and deraphoral sevenage	A79-35100	or managed and and and and and and and and and an	A79-33461

AIRCRAFT ENGINES SUBJECT INDEX

Very Large Vehicle Conference, Arlington, Va., April 26, 27, 1979, Technical Papers	AIRCRAFT EQUIPMENT Correlation study between vibrational
A79-33827 Large wing-in-ground effect transport aircraft	environmental and failure rates of civil helicopter components
[AIAA 79-0845] A79-33830	[NASA-CR-159033] N79-23064
Large lighter-than-air vehicles [AIAA 79-0847] A79-33831	Miniature flow-direction and airspeed sensor for airplanes and radio controlled models in spin
Concept for a large multi-mission amphitian aircraft	studies
[AIAA 79-0849] A79-33832 Strategic airlift vehicle concepts	[NASA-TP-1467] N79-23081 Polyurethane foams for aircraft shock mounts. 2:
[AIAA 79-0850] A79-33833	Polybutadiene based foams
Technology requirements and readiness for very	[AD-A064859] N79-23219
large vehicles [AIAA 79-0851] A79-33834	Advanced fabrication processes [AGARD-CP-256] N79-23236
Advanced nuclear systems for large aircraft	An evaluation of coatings for steel and titanium
[AIAA 79-0852] A79-33835 Britain's better airbus wing A-310 aircraft	alloy fasteners for aircraft applications N79-23242
wing design	AIRCRAFT FUELS
A79-34823 Technical characteristics and cost data for the	Fuel property effects on combustor performance aircraft synthetic and petroleum-derived fuels
I1-62 and I1-62M aircraft and optimal flight	[ASME PAPER 79-GT-178] A79-32438
conditions A79-35475	Catalytic combustion for gas turbine applications [ASME PAPER 79-GT-188] A79-32447
Optimization of wing structures to satisfy	A research study into the reliability of various
strength and frequency requirements A79-35717	fuel, hydraulic and air conditioning components
A method for the optimal layout of driving	of military aircraft A79-33459
mechanisms of the aileron for gliders and	Preventing fires in airport fuel systems
motorplanes A79-35921	A79-34923 AIRCRAFT GUIDANCE
High angle of attack characteristics of different	Advanced application of the MADGE approach aid
fighter configurations N79-21998	offshore A79-33457
Aerodynamic characteristics of a fighter-type	AIRCRAFT INDUSTRY
configuration during and beyond stall	An economic model of the manufacturers' aircraft
Extended analytical study of the	production and airline earnings potential, volume 3
free-wing/free-tribmer concept	[NASA-CR-152158] N79-22064
[NASA-CR-3135] N79-22040 Aerodynamic design and analysis of the AST-200	AIRCRAPT INSTRUBERTS A new high product rate 10 nanosecond, 256 point
supersonic transport configuration concept	correlator for weapon system applications
[NASA-CR-159051] N79-22046 Engineer design test 1, Hughes YAH-64, advanced	and fluid mechanics research A79-34305
attack helicopter	Digital data acquisition system for use in
[AD-A064359] N79-22077 A brief review of air flight weapons	aircraft engine condition monitoring [ARL-MECH-ENG-REPT-151] N79-23088
N79-23051	AIRCRAFT LANDING
An integrated fault-tolerant avionics system concept for advanced aircraft	Takeoff and landing ground rules N79-23001
[AD-A065136] N79-23082	Flight investigation of piloting techniques and
Adaptation for the economy or adaptation for energy conservation passenger aircraft design	crosswind limitations using a research type crosswind landing gear
[AAAF-NT-77-23] pussenger director design	[NASA-TP-1423] N79-23012
AIRCRAFT ENGINES Starting torque characteristics of small aircraft	AIRCRAFT MAINTENANCE Correlation study between vibrational
gas turbines and APU's	environmental and failure rates of civil
[ASNE PAPER 79-GI-95] A79-32371	helicopter components
Nuclear B1-Brayton system for aircraft propulsion [ASME PAPER 79-GT-119] A79-32389	[NASA-CR-159033] N79-23064 AIRCRAFT HODRLS
An analysis of aeroengine fan flutter using twin	A flyable suspended model helicopter for the
orthogonal vibration modes [ASME PAPER 79-GT-126] A79-32395	investigation of the human pilot behaviour A79-35923
Oil squeeze film dampers for reducing vibration of	Low-speed wind-tunnel parametric investigation of
aircraft gas turbine engines [ASME PAPER 79-G1-133] A79-32402	flight spoilers as trailing-vortex-alleviation devices on a transport aircraft model
A review of small gas turbine combustion system	[NASA-TP-1419] N79-22038
development [ASME PAPER 79-GT-136] A79-32405	Wind tunnel corrections for STOL models N79-22998
Characteristic time correlations of pollutant	Computer formulations of aircraft models for
<pre>emissions from an annular gas turbine combustor of aircraft engines</pre>	simulation studies [NASA-TP-1470] N79-23008
[ASME PAPER 79-GT-194] A79-32452	[NASA-TP-1470] N79-23008 Similitude, manufacturing, identification, and
The powered glider, SZD-45A Ogar	instrumentation of test models aircraft models
A79-32584 Damping capacity of paired shrouded turbine blades	[AAAP-NT-78-24] N79-23120 Construction problems specific to models for high
in relation to shroud contact conditions	Reynolds number wind tunnels scale models
A79-32827 Regression simulation of turbine engine	[AAAP-NT-78-02] N79-23124 AIRCRAFT HOISE
performance/aircraft regression model	Traffic background level and signal duration
[AD-A063975] N79-22106 Hydrazine monopropellant reciprocating engine	effects on aircraft noise judgment A79-34580
development	Quieter short and medium haul aircraft
N79-22540 Digital data acquisition system for use in	A79-34921 Light propeller aircraft noise
aircraft engine condition monitoring	A79-34980
[ARL-MECH-ENG-REPT-151] N79-23088 Analytical derivatives	The derivation of a thickness noise formula for
[AD-A064944] N79-23090	the far-field by Isom applied to helicopter rotors
•	A79-35449

SUBJECT INDEX AIRFOIL PROFILES

Procedure for noise prediction and optimization of advanced technology propellers	Aerodynamic effects simulator for testing aircraft escape systems
[NASA-CR-3080] DOD's commendable initial efforts to solve land	Ejection systems in the year 2000
use problems around airfields [PB-291617/9] B79-22120	U.S. Navy developments in crashworthy seating
Engine integration and noise considerations for STOL alreraft	A79-33623 Unique crew escape concepts for ATS mission aircraft
AIRCHAPT PARTS	A79-33636 High strength stitching for aircraft personnel
A research study into the reliability of various fuel, hydraulic and air conditioning components	restraint systems A79-33639
of military aircraft A79-33459	Lightning transient research on an P-111E aircraft [AD-A063765] N79-22066
Study of installed environment of various equipments in military aircraft	Test and evaluation of modified high performance jet aircrew life preserver
A79-33460 Heat treatment of P/M nickel-base superalloys for	[AD-A063959] N79-22067 Prost formation on an airfoil: A mathematical
turbine disks N79-23254	model 1 [NASA-CR-3129] N79-22706
AIRCRAFT PERFORMANCE	Ignition of fuel sprays by hot surfaces and
Measuring and improving ATC capacity	stabilization of aircraft fires
A79-33024	[AD-A065153] N79-23181
Four jets for short-haul work Ble 146	AIRCRAPT SPECIFICATIONS
179-34922	The powered glider, SZD-45A Ogar
A special extension of the General Point	A79-32584
Performance Equation for flight paths A79-35926	AIRCHAPT STABILITY
	Selected problems concerning unstable operation of
Regression simulation of turbine engine	aircraft turbine engine compressors A79-32589
performance/aircraft regression model [AD-A063975] N79-22106	AIRCRAFT STRUCTURES
Review lecture on transport aircraft. Concepts,	Dynamic identification of light aircraft
utilization and prospects	structures and flutter certification
N79-23000	[ONERA, TP NO. 1979-31] A79-32302
The aerodynamics and performance characteristics	Cost-effective production of flight vehicle shells
of direct lift schemes	by the pressure and flow-pressure processes
N79-23004	[DGLB PAPER 79-008] A79-32305
AIRCRAFT PRODUCTION	Numerical representation of aircraft geometry
Cost-effective production of flight vehicle shells	A79-32588
by the pressure and flow-pressure processes	Composites tooling speeds fabrication - Energy,
[DGLR PAPER 79-008] A79-32305	labor cost cut sharply
NC equipment spurs blisk manufacture - Full-scale	A79-33587
production slated Numerical Control for	Copter windshields made tougher - Special coating
integrated helicopter compressor blade and disk	extends life, adds safety
manufacture	A79-33588
A79-33589	Economical processing for the fabrication of CFRP
AIRCRAFT RELIABILITY	components
A research study into the reliability of various	[DGLE PAPER 79-009] A79-33600
fuel, hydraulic and air conditioning components of military aircraft	Aircraft glassmaker windshield supply for Boeing 767 and 747 aircraft
A79-33459	A79-34470
Study of installed environment of various	End-to-end testing to verify electrical
equipments in military aircraft	equipment failure due to carbon fibers released
A79-33460	in aircraft-fuel fires
STOL technology, volume 1	N79-22204
[VKI-LECTURE-SERIES-60-VOL-1] N79-22996	Helicopter fatigue. A review of current
Alrworthiness and certification aspects of civil	requirements and substantiation procedures
aircraft for STOL	[AGARD-R-674] N79-23074
ห79-22997	Fatigue life estimation methods for helicopter
Fatigue of helicopters: Service life evaluation	structural parts
method	N79-23077
N79-23079	Concurrent superplastic forming/diffusion bonding
AIRCRAFT SAPETY	of B-1 components
Conflict alert for the air traffic control system	N79-23251
A79-33605 Beacon-based collision avoidance system -	Operational experience with adhesive bonded
Experimental results	structures N79-23450
A79-33606	AIRPOIL PROPILES
Factors in evaluating the effectiveness of a	A general solution for distorted flows in cascades
collision avoidance logic	of aerofoils
A79-33607	[ASME PAPER 79-GT-65] A79-32353
Threat logic for air-derived CAS Collision	An experimental study of endwall and airfoil
Avoidance System	surface heat transfer in a large scale turbine
A79-33608	blade cascade
Mechanism of extremity injuries occurring during	[ASME PAPER 79-GT-99] A79-32375
ejection from P-4 aircraft	The time-variant aerodynamic response of a stator
A79-33610	row including the effects of airfoil camber
Aviation emergency procedures	[ASME PAPER 79-GT-110] A79-32385
A79-33611	Computer-aided design - Aerodynamics
CFR vehicle design and performance objectives	A79-33456
Crash Fire Rescue	Time-variant aerodynamics of oscillating airfoil
A79-33612	surfaces in a supersonic flowfield
An overview of the U.S. Navy Maximum Performance	A79-34531
Ejection System	Experimental investigation of three helicopter
A79-33613	rotor airfoils designed analytically in the
Vertical-seeking autopilot design of thrust	Langley 6 by 19 inch and 6 by 28 inch transonic
vector controlled ejection seat A79-33615	wind tunnels
8/9-33615	[NASA-TP-1396] N79-22037

AIRPOILS SUBJECT INDEX

The effect of surface imperfections on the aerodynamic performance of an airfoil at moderate Reynolds numbers	A comparison of costs associated with local actions to reduce aircraft noise impacts A79-34973
[BU-217] N79-23048 Studies of the dynamic stall or airfoil profiles	Off-airport land use compatibility - The Maryland approach and experience
for helicopter rotors [AD-A065106] N79-23071	A79-34974 National airport system plan 1978 - 1987
Study of blade aspect ratio on a compressor front stage aerodynamic and mechanical design report	N79-23060
[NASA-CR-159555] N79-23085	FAA proposes that the standard noise model be the integrated noise model /INM/
Some experimental results connected with the transonic instabilities on an airfoil A79-32671	A79-34975 An assessment of local risk to area associated with commercial operations of aircraft with
Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading	graphite fiber composite structures N79-22207 Integrated noise model computerized simulation
[NASA-CR-158488] N79-22036	of commercial jet aircraft noise near airports N79-22851
Frost formation on an airfoil: A mathematical model 1	AIRSHIPS
[NASA-CR-3129] N79-22706	Large lighter-than-air vehicles
AIRFBAMES Intake design and intake/airframe integration for	[AIAA 79-0847] A79-33831 AIRSPEED
a post-stall fighter aircraft concept N79-22027	Miniature flow-direction and airspeed sensor for airplanes and radio controlled models in spin
Highly survivable truss tail boom [AD-A064181] N79-22079	studies [NASA-TP-1467] N79-23081
Regression simulation of turbine engine	ALGORITHMS
performance/aircraft regression model [AD-A063975] N79-22106	Threat logic for air-derived CAS Collision Avoidance System
Evaluation of composite wing for XFV-12A airplane,	A79-33608
appendix C [AD-A063848] N79-22215	An efficient algorithm for computing the O-quidance matrix
Aerospace Transparent Materials and Enclosures	[AD-A064816] N79-22074
(12th) [AD-A065049] N79-23066	Application of model algorithmic control to a lightly damped single input single output system
Test plan for a one-half scale laboratory model of a rigid skirt hold-down system	[AD-A064222] N79-22115
[AD-A065171] N79-23115 AIRLINE OPERATIONS	The role of the backside parameter in height control A79-34522
Air France's Paris-Tokyo transpolar flight in 1978 A79-32583	ALUMINUM COATINGS Research on the creep-rupture strength of
Airline productivity redefined - An analysis of U.S. and European carriers A79-35100	aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586
An analysis of long and medium-haul air passenger demand, volume 1	AMPHIBIOUS AIRCHAFT Concept for a large multi-mission amphibian aircraft
[NASA-CR-152156] N79-22062 An analysis of short haul air passenger demand,	[AIAA 79-0849] A79-33832 ANALOG SIBULATION
volume 2 [NASA-CR-152157] N79-22063	An investigation into the transient aerodynamics associated with a spoiler emerging into a
An economic model of the manufacturers' aircraft production and airline earnings potential,	uniform airstream [BU-219] N79-23046
volume 3 [NASA-CR-152158] N79-22064	ANALYSIS OF VARIANCE The effect of a sample lot of fuel JECTORS on
AIRPLANE PRODUCTION COSTS Ultrasonic bonding arrives - 75% cost savings seen	emissions levels of a small gas turbine [ASME PAPER 79-GT-165] A79-32427
A79-33586 Composites tooling speeds fabrication - Energy,	ANALYTIC FUNCTIONS Analytical derivatives
labor cost cut sharply	[AD-A064944] N79-23090
A79-33587 Fewer controls, easier inspection - Diffusion	ANDMONETERS Two dimensional anemometric probe two
bonding shows cost advantages A79-33591	dimensional flow. Wind tunnel tests
Economical processing for the fabrication of CFRP	[AAAF-NT-78-09] N79-23116 Optical flow measurements: Applications to wind
components [DGLR PAPER 79~009] A79-33600	tunnels or motor bench tests [AAAF-NT-78-07] N79-23117
An economic model of the manufacturers' aircraft production and airline earnings potential,	ANGLE OF ATTACK Hypersonic viscous shock layer on infinite-span
volume 3 [NASA-CR-152158] N79-22064	arrow wings at angle of attack A79-35158
AIRPORT PLANNING	High angle of attack aerodynamics
The principle and practice of 'clutch' radar operation	[AGARD-CP-247] N79-21996 Effect of high angles of attack on dynamic
A79-33025 Conflict alert for the air traffic control system	stability parameters N79-21997
A79-33605 CPR Vehicle design and performance objectives	High angle of attack characteristics of different fighter configurations
Crash Pire Rescue	N79-21998 Some UK research studies of the use of wing-body
Perspectives on dirport environmental compatibility; Proceedings of the	strakes on combat aircraft configurations at high angles of attack
Economic/Environmental Specialty Conference,	N79-21999
Miami, Fla., March 2, 3, 1978 A79-34971	The application of spanwise blowing for high angle of attack spin recovery
Airport noise control and land use compatibility	N79-22004
study A79-34972	Behavior of a transport aircraft with a high aspect ratio wing at a high angle of incidence W79-22005

SUBJECT INDEX BATTERY CHARGERS

Vortex pattern developing on the upper surface of	ATTACK AIRCHAPT
a swept wing at high angle of attack	Engineer design test 1, Hughes YAH-64, advanced
N79-22007	attack helicopter
Normal force and pitching moment of wing-body	[AD-A064359] N79-22077
combinations in the nonlinear angle-of-attack	ATTITUDE CONTROL
range at subsonic speeds N79-22022	An experimental passive microwave attitude
Prediction of aerodynamic characteristics for	measurement system for escape system steering A79~33637
slender bodies alone and with lifting surfaces	AUGRENTATION
to high angles of attack	A piloted simulator study on augmentation systems
N79-22023	to improve helicopter flying qualities in
Prediction of lateral aerodynamic loads on	terrain flight
aircraft at high angles of attack	[NASA-TM-78571] N79-23098
N79-22024	AUTOMATIC CONTROL
Prediction and measurement of the aerodynamic	Development and initial test results of parachutes
forces and pressure distributions of wing-tail configurations at very high angles of attack	with Automatic Inflation Modulation /A.I.M./
N79-22025	AUTOBATIC CONTROL VALVES
High angle of incidence implications upon air	Dynamic behaviour and control of single-shaft
intake design and location for supersonic cruise	closed-cycle gas turbines
aircraft and highly maneuverable transonic	ท79-22095
alrcraft	AUTOMATIC PLIGHT CONTROL
N79-22026	Semiautomatic control of aircraft: Systems of
Intake design and intake/airframe integration for	manual aircraft control Russian book
a post-stall fighter aircraft concept N79-22027	A79~34504
Visualisations and calculations of air intakes at	AUTOHATIC PILOTS Peasibility demonstration of a vertical seeking
high angles of attack and low Reynolds number	seat steering system
Navier-Stokes equation	A79-33614
N79-22030	Vertical-seeking autopilot design of thrust
A survey of recent high angle of attack; wind	vector controlled ejection seat
tunnel testing at Aeritalia	A79-33615
N79-22034	AUXILIARY POWER SOURCES
Miniature flow-direction and airspeed sensor for airplanes and radio controlled models in spin	Starting torque characteristics of small aircraft
studies	gas turbines and APU's [ASME PAPER 79-GT-95] A79-32371
[NASA-TP-1467] N79-23081	AVIONICS
ANNULAR PLON	Suppression of radio-electrical disturbances of
Three-dimensional lifting-surface theory for an	electrostatic origin on aircraft
annular blade row	A79-34978
[ASME PAPER 79-GT-182] A79-32441	An integrated fault-tolerant avionics system
ANNOLAR MOZZLES	concept for advanced aircraft
Performance of a vortex-controlled diffuser in an appular swirl-can combustor at inlet Mach	[AD-A065136] N79-23082
numbers up to 0.53	Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083
Hembers of to organ	
FNASA-TP-14521 N79-22099	
[NASA-TP-1452] N79-22099 ANTENNA ARRAYS	A study of embedded computer system software
ANTENNA ARRAYS Radiation field of a conformal phased array of	A study of embedded computer system software acquisition management and recommendations to improve development visibility
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] #79-23681
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] N79-23681 AXIAL FLOW
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] N79-23681 NILL FLOW The effects of design and operating variables on
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] W79-23681 AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines
ANTENNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTENNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23094 AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASRE PAPER 79-GT-123] A79-32392
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TORBINES Performance estimation of partial admission turbines [ASRE PAPER 79-GT-123] Thermal influences in gas turbine transients— Effects of changes in compressor characteristics
RADIATION field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Hethods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] A79-32409
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPPER 79-GT-143] The effects of design and operating variables on
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSIER DEFENSE	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] A79-32409
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Bultichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] APTIBISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CORTROL	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASME PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Axial flow turbines flow relations and equations
RADIATION ABRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTINISSIES DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Reasuring and improving ATC capacity	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASRE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASRE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Resuring and improving ATC capacity	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22082 Closed Cycle Gas Turbines
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] APTIBISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASME PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093
ANTENNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTENNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTINISSILE DEPENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Reasuring and improving ATC capacity The principle and practice of 'clutch' radar operation	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087 Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] APTIBISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASME PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AT9-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles APPROACH CONTROL Resuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33025	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] N79-23681 N79-23681 N79-23681 N79-23681 N79-23681 N79-23094 N79-23096 N79-23096 N79-23096 N79-22087 N79-22087 N79-22087 N79-22092 N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093 N79-22093 N79-22093 N79-22093
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore A79-33457	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AT9-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTINISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 Advanced application of the MADGE approach and offshore A79-33457 New technology S618 simulator	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASME PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] AV9-22092 Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT
RADIATION ABRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTINISSILE DEPENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore A79-33457 New technology S618 simulator	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087 Axial flow turbines flow relations and equations (VKI-LECTURE-SERIES-24) Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore New technology S618 simulator A79-33458 ARROW #IHGS	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [VKI-LECTORE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B-1 AIRCHAFT Concurrent superplastic forming/diffusion bonding of F-1 components
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIRISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach and offshore A79-33457 New technology S618 simulator A79-33458 ARROW #IMGS Eypersonic viscous shock layer on infinite-span	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASME PAPPR 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPPR 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093 Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components
ANTENNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTENNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTINISSILE DEPENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation Advanced application of the MADGE approach aid offshore New technology S618 simulator A79-33457 New technology S618 simulator A79-33458 ARROW WINGS Hypersonic viscous shock layer on infinite-span arrow wings at angle of attack	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087 Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components N79-23251 BACKGROUED BOISE
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles AP9-35210 APPROACH CONTROL Reasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore New technology S61N simulator AP9-33457 New technology S61N simulator AP9-33458 APPROSONIC viscous shock layer on infinite-span arrow wings at angle of attack A79-35158	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] NT9-23681 NTIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] NT9-23094 NTIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [VKI-LECTORE-SERIES-24] N79-22092 Closed Cycle Gas Turbines [VKI-LECTORE-SERIES-24] Advanced composite engine rotor design [AD-A063843] N79-22105 B B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of F-1 components N79-23251 BACKGROUBD HOISB Traffic background level and signal duration
ANTENNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTENNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTINISSILE DEPENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation Advanced application of the MADGE approach aid offshore New technology S618 simulator A79-33457 New technology S618 simulator A79-33458 ARROW WINGS Hypersonic viscous shock layer on infinite-span arrow wings at angle of attack	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087 Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components N79-23251 BACKGROUED BOISE
RATIENDA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles AP9-35210 APPROACH CONTROL Reasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore New technology S61N simulator AP9-33457 ARROW WINGS Rypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHERIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL PLOW TURBINES Performance estimation of partial admission turbines [ASME PAPPR 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPPR 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] AV9-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093 Advanced composite engine rotor design [AD-A063843] B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components N79-23251 BACKGROUBD HOISB Traffic background level and signal duration effects on aircraft noise judgment
ANTENDA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTINISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33457 New technology S618 simulator A79-33458 ARROW #INGS Rypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHERIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel [BU-221] N79-23125	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] AD-A063843] B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components N79-22051 BACKGROUBD NOISE Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed
RATIENDA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AT9-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AT9-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] APTIBLESTILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles AT9-35210 APPROACH COBTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation Advanced application of the HADGE approach and offshore New technology S618 simulator AT9-33457 New technology S618 simulator ARROW WINGS Hypersonic viscous shock layer on infinite-span arrow wings at angle of attack AT9-35158 ATHOSPHBBIC BOUNDARY LAYEB The effect of blockage in shear flow in the wind tunnel [BU-221] ATHOSPHBBIC TUBBULENCE	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] ANIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] ANIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components N79-23251 BACKGROUBD NOISE Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed flexible rotor
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AT9-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] NT9-23331 ANTIHISSILE DEFENSE Hultichannel infrared receiver performance for airborne detection of antiaircraft missiles APPROACH CONTROL Reasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33025 Advanced application of the MADGE approach aid offshore New technology S61N simulator A79-33457 New technology S61N simulator A79-33458 APROW WINGS Eypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHERIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel [BU-221] ATHOSPHERIC TUBBULENCE Thunderstorm turbulence investigations for	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPEN 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPEN 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations [NASA-CR-158522] Avaial flow turbines flow relations and equations [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components B B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components B B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components B B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components A79-32351 BACKEBOURD HOISE Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed fleiible rotor [ASHE PAPEN 79-GT-56] A79-32351
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTINISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33457 New technology S61N simulator A79-33457 ARROW WINGS Hypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHERIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel [BU-221] ATHOSPHERIC TURBULENCE Thunderstorm turbulence investigations for 1973-1974 in support of the National Severe	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] N79-23681 N79-23681 N79-23681 N79-23681 N79-23094 N79-23092 Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPPR 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22092 Advanced composite engine rotor design [AD-A063843] N79-22105 B B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components N79-2251 BACKGROUBD NOISE Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed flexible rotor [ASHE PAPER 79-GT-56] A79-32351 BATTERY CHARGERS
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 ANTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] N79-23331 ANTIBISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33457 New technology S618 simulator A79-33458 ARROW WINGS Rypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHEBIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel [BU-221] N79-23125 ATHOSPHEBIC TUBBULENCE Thunderstore turbulence investigations for 1973-1974 in support of the National Severe Storms Laboratory (NSSL)	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] ANIAL PLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] ANIAL PLOW TURBINES Performance estimation of partial admission turbines [ASHE PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22087 Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] Advanced composite engine rotor design [AD-A063843] B B-1 AIRCRAFT Concurrent superplastic forming/diffusion bonding of E-1 components N79-23251 BACKGROUBD HOISE Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed flexible rotor [ASHE PAPER 79-GT-56] BATTERY CHARGERS Development of a NICAD battery interface unit
ANTERNA ARRAYS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution AP9-32734 ABTERNA RADIATION PATTERNS Radiation field of a conformal phased array of rotational-polarization elements situated on a surface of revolution A79-32734 Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency coverage [AD-A065151] ANTINISSILE DEFENSE Multichannel infrared receiver performance for airborne detection of antiaircraft missiles A79-35210 APPROACH CONTROL Heasuring and improving ATC capacity The principle and practice of 'clutch' radar operation A79-33024 The principle and practice of 'clutch' radar operation A79-33457 New technology S61N simulator A79-33457 ARROW WINGS Hypersonic viscous shock layer on infinite-span arrow wings at angle of attack A79-35158 ATHOSPHERIC BOUNDARY LAYER The effect of blockage in shear flow in the wind tunnel [BU-221] ATHOSPHERIC TURBULENCE Thunderstorm turbulence investigations for 1973-1974 in support of the National Severe	A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] AXIAL FLOW The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] AXIAL FLOW TURBINES Performance estimation of partial admission turbines [ASME PAPER 79-GT-123] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] Axial flow turbines flow relations and equations N79-22092 Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24] N79-22093 Advanced composite engine rotor design [AD-A063843] B-1 AIRCEAPT Concurrent superplastic forming/diffusion bonding of E-1 components N79-22105 B BACKGROUBD NOISB Traffic background level and signal duration effects on aircraft noise judgment A79-34580 BALANCING Laser balancing demonstration on a high-speed flexible rotor [ASHE PAPER 79-GT-56] A79-32351 BATTERY CHARGERS

BEARINGS SUBJECT INDEX

BRARINGS	Closed Brayton cycle system optimization for
User's manual for steady state and transient	undersea, terrestrial, and space applications
thermal analysis of a shaft-bearing system	BUCKLING N79-22096
(SHABERTH) [AD-A064150] N79-22523	
BIBLIOGRAPHIES	orthotropic structural sections
Turbine blades: Erosion and Corrosion. Citations	A79-33461
from the NTIS data base	BUFFBTING
[NTIS/PS-79/0148/1] N79-22111	
Turbine blades: Erosion and Corrosion. Citations	tunnel T-33 aircraft
from the Engineering Index data base	[AAAF-NT-78-17] N79-23104
[NTIS/PS-79/0149/9] N79-22112 Ames Research Center publications, 1977	•
[NASA-TM-78514] N79-22957	C
BLADE TIPS	C-5 AIRCRAFT
Unsteady pressure measurements on rotor blade tips	Definition of requirements for a performance
with incidence	measurement system for C-5 aircrew members
179-34534	
BLOWING	CABLES (HOPES)
The application of spanwise blowing for high angle	Dynamic stability of a flight vehicle laying out
of attack spin recovery N79-22004	an uncoiling line A79-32919
BODY-WING AND TAIL COMPIGURATIONS	CAMBER
Prediction and measurement of the aerodynamic	The time-variant aerodynamic response of a stator
forces and pressure distributions of wing-tail	row including the effects of airfoil camber
configurations at very high angles of attack	[ASME PAPER 79-GT-110] A79-32385
N79-22025	On slender wings with leading edge camber
BODY-WING CONFIGURATIONS	N79-22032
Optimization of hypersonic three-dimensional shapes	The flow through low cambered transonic turbine
A79-35584	cascade N79-22089
Forebody/wing vortex interactions and their	CANARD CONFIGURATIONS
influence on departure and spin resistance N79-22001	
Normal force and pitching moment of wing-body	intake design and location for supersonic cruise
combinations in the nonlinear angle-of-attack	aircraft and highly maneuverable transonic
range at subsonic speeds	alrcraft
N79-22022	
Prediction of lateral aerodynamic loads on	Aerodynamic characteristics of the close-coupled
aircraft at high angles of attack N79-22024	canard as applied to low-to-moderate swept wings. Volume 1: General trends
Aerodynamic characteristics at Mach numbers of	[AD-A063819] N79-22057
1.5, 1.8, and 2.0 of a blended wing-body	Aerodynamic characteristics at Mach numbers of
configuration with and without integral canards	1.5, 1.8, and 2.0 of a blended wing-body
[NASA-TP-1427] N79-23013	
Development of a viscous vortex/wing interaction	[NASA-TP-1427] N79-23013
program for thick wings with bounded leading edge	CANOPIES
[AD-A065181] N79-23020 BOEIEG 747 AIRCRAFT	
Aircraft glassmaker windshield supply for	with Automatic Inflation Modulation /A.I.H./ A79-33618
Boeing 767 and 747 aircraft	On the status of experimental stress analysis of
A79-34470	
BORIDES	A79-33646
Erosion resistant clad rotor blades - Boride	Aircraft glassmaker windshield supply for
coatings do the job	Boeing 767 and 747 aircraft A79-34470
BOUNDARY LAYER FLOW	Aerospace Transparent Materials and Enclosures
Computer program to calculate three-dimensional	(12th)
boundary layer flows over wings with wall mass	[AD-A065049] N79-23066
transfer	CANTILEVER BEAMS
[NASA-CR-3123] N79-23016	
BOUNDARY LAYER SEPARATION	resilient-pad gas-lubricated thrust bearing
Subcritical drag minimization for highly swept	[NASA-TP-1438] N79-22518 CARBON FIBER REINFORCED PLASTICS
wings with leading edge vortices N79-22021	Economical processing of fiber-reinforced
Effects of turbulence on laminar separation on	components with thermal expansion molding
aerodynamic surfaces such as airfoils and	CFRP structures for aircraft aileron
compressor blading	
	[DGLR FAPER 79-011] A79-32307
[NASA-CR-158488] N79-22036	Economical processing for the fabrication of CFRP
[NASA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION	<pre>Boonomical processing for the fabrication of CPRP components</pre>
[NASA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on	Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] A79-33600
[NAŚA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIEBES
[NASA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on	Boonomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites
[NASA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer	Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] A79-33600 CARBOW FIBERS Carbon fibers and composites N79-22199
[NASA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition	Boonomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200
[NASA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning	Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBBRS Carbon fibers and composites N79-22199 Source of released carbon fibers End-to-end testing to verify electrical
[NAŚA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites Source of released carbon fibers Prop-22199 End-to-end testing to verify electrical equipment failure due to carbon fibers released
[NASA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition N79-23109 BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIERES Carbon fibers and composites N79-22199 Source of released carbon fibers End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires
[NASA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor	Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBOW FIBBRS Carbon fibers and composites N79-22199 Source of released carbon fibers Processor of the second processor of th
[NAŚA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites R79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated
[NAŚA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in congressor cascades: A review of available data N79-23428	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated with commercial operations of aircraft with
[NAŚA-CR-158488] N79-22036 BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBOD FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures
[NASA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data BOUNDARY VALUE PROBLESS	Bronomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures N79-22207 An assessment of national risk: General concepts
[NASA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data N79-23428 BOUNDARY VALUE PROBLESS Solution of boundary value problems for the vibration equation for a jet engine model A79-35895	Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBOW FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures N79-22207 An assessment of national risk: General concepts and overall approach carbon fiber
[NAŚA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data BOUNDARY VALUE PROBLEMS Solution of boundary value problems for the vibration equation for a jet engine model BRATTON CYCLE	Reconomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBBRS Carbon fibers and composites R79-22199 Source of released carbon fibers R79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires R79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures R79-22207 An assessment of national risk: General concepts and overall approach carbon fiber utilization in commercial aviation
[NAŚA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data BOUNDARY VALUE PROBLEMS Solution of boundary value problems for the vibration equation for a jet engine model A79-35895 BRAYTON CYCLE Nuclear BI-Erayton system for aircraft propulsion	Beonomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBERS Carbon fibers and composites N79-22199 Source of released carbon fibers N79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires N79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures N79-22207 An assessment of national risk: General concepts and overall approach carbon fiber utilization in commercial aviation N79-22208
[NAŚA-CR-158488] BOUNDARY LAYER TRANSITION Effects of flow turbulence and noise on aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer transition BOUNDARY LAYERS Shock boundary layer interaction on high turning transonic turbine cascades A79-32342 Shock-boundary layer interaction in compressor cascades: A review of available data BOUNDARY VALUE PROBLEMS Solution of boundary value problems for the vibration equation for a jet engine model BRATTON CYCLE	Reconomical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600 CARBON FIBBRS Carbon fibers and composites R79-22199 Source of released carbon fibers R79-22200 End-to-end testing to verify electrical equipment failure due to carbon fibers released in aircraft-fuel fires R79-22204 An assessment of local risk to area associated with commercial operations of aircraft with graphite fiber composite structures R79-22207 An assessment of national risk: General concepts and overall approach carbon fiber utilization in commercial aviation

SUBJECT INDEX COMBUSTION PRINCIPLE

CARGO AIRCRAFT Demand for large freighter aircraft as pro	nected	CHEMICAL PROPERTIES Fuel property effects on combustor performa	ance
by the NASA cargo/logistics airlift systematics		aircraft synthetic and petroleum-derived	
studies		[ASHE PAPER 79-GT-178]	A79-32438
[AIAA 79-0842]	A79-33829	CIRCUIT PROTECTION	
Shock boundary layer interaction on high to	nrnina	Suppression of radio-electrical disturbance electrostatic origin on aircraft	es or
transonic turbine cascades	drurna	cicottostatto origin on arretar	A79-34978
	A79-32342	CIRCULAR POLARIZATION	
A general solution for distorted flows in	cascades	Radiation field of a conformal phased array	
of aerofoils	A79-32353	rotational-polarization elements situated surface of revolution	n on a
[ASME PAPER 79-GT-65] An experimental study of endwall and airfo		Sallace of levold(10#	A79-32734
surface heat transfer in a large scale t		CIVIL AVIATION	
blade cascade		Aviation emergency procedures	
[ASME PAPER 79-GT-99]	179-32375	Cararal amakaan TRD anamataanal problems	A79-33611
Aerodynamic and aeroelastic characteristic oscillating loaded cascades at low Mach		General aviation IFR operational problems [NASA-CR-159022]	N79-22068
I - Pressure distribution, forces, and me		An assessment of national risk: General co	
[ASHE PAPER 79-GT-111]	A79-32386	and overall approach carbon fiber	_
Optimization for rotor blades of tandem des	sıgn for	utilization in commercial aviation	
axial flow compressors	A79-32394	CLEAR AIR TURBULENCE	N79-22208
[ASME PAPER 79-GT-125] Low-turbulence high-speed wind tunnel for		Detection of CAT and low altitude wind she	ar by
determination of cascade shock losses		on-board aircraft IR sensors - An update	-
[ASHE PAPER 79-GT-129]	A79-32398		A79-33630
Effect of interblade phase angle and incide	епсе	CLOSED CYCLES	
angle on cascade pitching stability [ASME PAPER 79-GT-153]	A79-32418	Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24]	N79-22093
Three-dimensional lifting-surface theory for		Closed power cycles' analysis	
annular blade row			N79-22094
[ASME PAPER 79-GT-182]	A79-32441	Dynamic behaviour and control of single-sha	aft
Numerical analysis of flow through turbine		closed-cycle gas turbines	N79-22095
cascades by the Modified FLIC Method	A79-32590	Closed Erayton cycle system optimization for	
The flow past a supersonic trailing edge is		undersea, terrestrial, and space applica-	
transonic turbine cascades			N79-22096
ml = 61-11 1 1 21-13 1 11-11	A79-32670	Calculation and design of closed cycle hel	1012
The flow through low cambered transonic to cascade	rbine	turbines for high temperature reactors	N79-22098
casoade	N79-22089	COCKPITS	
Sample calculation 4: Phi = 9 deg 57		Helicopter transparent enclosures. Volume	1:
mi kura kana a a a a a a a a a	N79-22490	Design handbook	N79-23068
The trajectories of spherical particles in through cascaded turning vanes	LTOM	[AD-A065268] COLLINEARITY	N/9-23000
[BU-220]	N79-23096	A computational scheme for structural influ	uence
Shock-boundary layer interaction in compres		coefficients of certain planar wings	
cascades: A review of available data	wan 22020	COLLECTOR ADOLDING	A79-34597
CASCADE WIND TONNELS	N79-23428	COLLISION AVOIDANCE Conflict alert for the air traffic control	system
Study of compressor aeroelastic instabilit.	ies in a		A79-33605
linear cascade wind tunnel		Beacon-based collision avoidance system -	
[ONERA, TP NO. 1979-6]	A79-32296	Experimental results	A79-33606
Some experimental results connected with t transonic instabilities on an airfoil	ne	Factors in evaluating the effectiveness of	
tidasodic instabilities on an alticii	A79-32671	collision avoidance logic	_
CASING			A79-33607
Aerodynamic design of fixed and variable g	eometry	Threat logic for air-derived CAS Collis	sion
nozzleless turbine casings [ASME PAPRE GT-87]	A79-32364	Avoidance System	A79-33608
CATALYSIS	217 32301	CONBUSTION CHAMBERS	
Catalytic combustion for gas turbine appli-		The combustion of a range of distillate fu	els ın
[ASME PAPER 79-GT-188]	A79-32447	small gas turbine engines	170-32025
CATHODE BAY TUBES Comparison of electromechanical and		[ASME PAPER 79-GT-175] Fuel property effects on combustor perform	179-32435
cathode-ray-tube display mediums for an		aircraft synthetic and petroleum-derived	fuels
instrument approach display		[ASME PAPER 79-GT-178]	A79-32438
[NASA-TM-80069]	N79-23080	Catalytic combustion for gas turbine appli	
CAVITATION PLOW		[ASME PAPER 79-GT-188] Account of film turbulence for predicting	A79-32447
Performance of a TAP-2 hydrofoil [AD-A065102]	N79-23261	cooling effectiveness in gas turbine com	
CENTRIFUGAL COMPRESSORS	, 2020.	[ASME PAPER 79-GT-200]	A79-32457
The fluid dynamic design of advanced centr.	ıfugal	Formation of sooty particles in combustion	
compressors	wan 22500	chambers with series injection of air in combustion zone	to the
Centrifugal-reciprocating compressor	N79-22508	compustion zone	A79-34550
[NASA-CASE-NPO-14597-1]	N79-23431	Performance of a vortex-controlled diffuse:	
CERAMIC COATINGS		annular swirl-can combustor at inlet Mac	
Tests of NASA ceramic thermal barrier coat.	ing for	numbers up to 0.53	N30 22002
gas-turbine engines	A79-34996	[NASA-TP-1452] Effect of primary-zone equivalence ratio o	ท79-22099
CRRAHICS	m/J-J4JJ0	pollutant formation	
A design review of ceramic components for	turbine	[NASA-TP-1463]	N79-23086
engines	.70 2000	COMBUSTION PHYSICS	
[ASME PAPER 79-GT-183] CH-47 HELICOPTER	A79-32442	Thermodynamics of organic compounds [AD-A065664]	N79-23232
CH-47 helicopter internal cargo load and r	estraint	[5252
system mock-up study			
[AD-A054207]	N79-22081		

COMBUSTION PRODUCTS SUBJECT INDEX

COMBUSTION PRODUCTS	COMPRESSOR ROTORS
The effect of a sample lot of fuel JECTORS on	An off-design correlation of part span damper
emissions levels of a small gas turbine	losses through transonic axial fan rotors
[ASME PAPER 79-GT-165] A79-32427	[ASME PAPER 79-GT-6] A79-32329
Characteristic time correlations of pollutant	Unsteady upstream effects in axial-flow supersonic
emissions from an annular gas turbine combustor	compressor stages
of aircraft engines	[ASME PAPER 79-GT-55] A79-32350
[ASME PAPER 79-GT-194] A79-32452	Forced vibrations of a single stage axial
Formation of sooty particles in combustion	compressor rotor
chambers with series injection of air into the	[ASME PAPER 79-GT-108] A79-32383
combustion zone	Optimization for rotor blades of tandem design for
A79-34550	axial flow compressors [ASME PAPER 79-GT-125] A79-32394
Effect of friction on motion of a piston driven by combustion products	Advanced composite engine rotor design
A79-35656	[AD-A063843] N79-22105
Effect of primary-zone equivalence ratio on	COMPRESSORS
pollutant formation	Design problems of small turbomachinery
[NASA-TP-1463] N79-23086	N79-22097
COMBUSTION STABILITY	Study of blade aspect ratio on a compressor front
Lo-frequency augmentor instability study	stage aerodynamic and mechanical design report
[AD-A065144] N79-22104	[NASA-CR-159555] N79-23085
Lo-frequency augmentor instability investigation	Effect of number of probes and their orientation
computer program user's manual [AD-A065774] N79-23093	on the calculation of several compressor face
COMMERCIAL AIRCRAFT	distortion descriptors [NASA-TH-72859] N79-23087
Evaluation applied to reliability analysis of	Hydraulic compressor for a wind tunnel
reconfigurable, highly reliable, fault-tolerant,	N79-23107
computing systems	The priming of a wind tunnel with a hydraulic
[NAŜA-TM-80090] N79-22783	compressor
Integrated noise model computerized simulation	N79-23108
of commercial jet aircraft noise near airports	Shock-boundary layer interaction in compressor
N79-22851	cascades: A review of available data
COMPONENT RELIABILITY A research study into the reliability of various	N79-23428
fuel, hydraulic and air conditioning components	Sample calculation 4: Phi = 9 deg 57
of military aircraft	N79-22490
A79-33459	COMPUTER DESIGN
Study of installed environment of various	Designing, calculating, and manufacturing by means
equipments in military aircraft	of data processing computer techniques for
A79-33460	mechanical constructions
Patigue of helicopters: Service life evaluation	A79-32751
method	COMPUTER PROGRAMS
COMPOSITE MATERIALS	The predesign phase of the second-generation
Composites tooling speeds fabrication - Energy,	comprehensive helicopter analysis system [AD-A063921] N79-22082
labor cost cut sharply	The generation, radiation and prediction of
A79-33587	supersonic jet noise. Volume 2, appendix:
Preliminary design study of a composite main rotor	Computer program listing
blade for the OH-58 helicopter. Volume 1:	[AD-A064685] N79-22854
Trade analysis and preliminary design study of	Computer program to calculate three-dimensional
composite OH-58 main rotor blade	boundary layer flows over wings with wall mass
[AD-A064159] N79-22080	transfer [NASA-CR-3123] N79-23016
Advanced composite engine rotor design [AD-A063843] N79-22105	[NASA-CR-3123] N79-23016 Systems approach to life-cycle design of
Evaluation of composite wing for XFV-12A airplane,	pavements. Volume 3: LIFE2 program listing
appendix C	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual
appendix C	[AD-A064698] N79-23260
appendix C [AD-A063848] N79-22215	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] A79-33600	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS
appendix C [An-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPEE 79-009] OH-58 composite main rotor blades preliminary	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of
appendix C [An-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPEN 79-009] OH-58 composite main rotor blades preliminary design investigation	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant,
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] N79-22085	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems
appendix C [An-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPEE 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] N79-22783
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] N79-22085	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems
appendix C [An-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [An-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330	[AD-A064698] N79-23260 System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] N79-22783 A study of embedded computer system software
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] N79-23681
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES
appendix C [An-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] A79-32378	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TH-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings
appendix C [Ab-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [Ab-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASME PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPEE 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASME PAPEE 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASME PAPEE 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings A79-34597 COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the
appendix C [Ab-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [Ab-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASHE PAPER 79-GT-53] Improving turbine efficiency aerodynamic and
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial flow compressors	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TH-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines
appendix C [Ab-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGIR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [Ab-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCT Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] A79-32394	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASHE PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] A79-32436
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] Thermal influences in gas turbine transients -	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) Visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] COMPUTERIZED DATE TO A T
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] A79-32394 Thermal influences in gas turbine transients - Effects of changes in compressor characteristics	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] Computer-aided design - Aerodynamics
appendix C [Ab-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [Ab-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASME PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial fifew compressors [ASME PAPER 79-GT-125] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASHE PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] Computer-aided design - Aerodynamics COMPUTERIZED SIBULATION
appendix C [An-Ao63848] COMPOSITE STRUCTURES Economical processing for the fabrication of CFRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [An-Ao65010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCT Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] Ap9-32394 Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-143] Selected problems concerning unstable operation of	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) Visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] Computer-aided design - Aerodynamics A79-33456 COMPUTERIZED SIMULATION Numerical analysis of flow through turbine
appendix C [Ab-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [Ab-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASME PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial fifew compressors [ASME PAPER 79-GT-125] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASHE PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] Computer-aided design - Aerodynamics COMPUTERIZED SIBULATION
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-123] Selected problems concerning unstable operation of aircraft turbine engine compressors	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) Visual system [AD-A065060] N79-23683 COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] Computer-aided design - Aerodynamics COMPUTERIZED SIMULATION Numerical analysis of flow through turbine cascades by the Modified FIIC Method A79-32590 Regression simulation of turbine engine
appendix C [AD-A063848] COMPOSITE STRUCTURES Economical processing for the fabrication of CPRP components [DGLR PAPER 79-009] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] COMPRESSOR BLADES Design and testing of two supercritical compressor cascades [ASHE PAPER 79-GT-11] A79-32330 The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASHE PAPER 79-GT-102] Effects of turbulence on laminar separation on aerodynamic surfaces such as airfoils and compressor blading [NASA-CR-158488] COMPRESSOR EFFICIENCY Optimization for rotor blades of tandem design for axial flow compressors [ASHE PAPER 79-GT-125] Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASHE PAPER 79-GT-123] Selected problems concerning unstable operation of aircraft turbine engine compressors	[AD-A064698] System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG) visual system [AD-A065060] COMPUTER SYSTEMS PROGRAMS Evaluation applied to reliability analysis of reconfigurable, highly reliable, fault-tolerant, computing systems [NASA-TM-80090] A study of embedded computer system software acquisition management and recommendations to improve development visibility [AD-A065879] COMPUTER TECHNIQUES A computational scheme for structural influence coefficients of certain planar wings COMPUTERIZED DESIGN An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASHE PAPER 79-GT-53] Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] Computer-aided design - Aerodynamics COMPUTERIZED SIMULATION Numerical analysis of flow through turbine cascades by the Modified FLIC Method

SUBJECT INDEX CYCLIC LOADS

Table and a second and a second and a		CANDET ISTAU	
Integrated noise model computerized si of commercial jet aircraft noise near ai		CORRELATION An off-design correlation of part span dam	Der
conscious jet direcuit noise near ar	N79-22851	losses through transonic axial fan rotor	s
Computer formulations of aircraft models f	or	[ASME PAPER 79-GT-6]	A79-32329
simulation studies [NASA-TP-1470]	N79-23008	CORRELATORS A new high product rate 10 nanosecond, 256	point
Lo-frequency augmentor instability investi		correlator for weapon system applica-	
computer program user's manual	770 22002	and fluid mechanics research	170-25206
[AD-A065774] User guide for STRBLN: A boundary-layer p	N79-23093	CORROSION PREVENTION	A79-34305
for contoured wind-tunnel liner design	,	Turbine blades: Prosion and Corrosion. C.	ltations
[NASA-CR-159058]	N79-23114	from the NTIS data base	W70 00444
Very Large Vehicle Conference, Arlington,	٧a	[NTIS/PS-79/0148/1] Turbine blades: Prosion and Corrosion. C	N79-22111 itations
April 26, 27, 1979, Technical Papers		from the Engineering Index data base	
Page	A79-33827	[NTIS/PS-79/0149/9]	N79-22112
Perspectives on airport environmental compatibility; Proceedings of the		The trajectories of spherical particles in through cascaded turning vanes	1108
Economic/Environmental Specialty Confere	nce,	[80-220]	N79-23096
Miamı, Fla., March 2, 3, 1978	370-24071	CORROSION RESISTANCE Turbine blades: Erosion and Corrosion. C	3+3+10nc
Advanced fabrication processes	A79-34971	from the NTIS data base	ttattons
[AG ARD-CP-256]	N79-23236	[NTIS/PS-79/0148/1]	N79-22111
CONICAL BODIES	21 ch	Turbine blades: Erosion and Corrosion. C from the Engineering Index data base	ıtatıons
Optimization of hypersonic three-dimension	A79-35584	[NTIS/PS-79/0149/9]	N79-22112
CONSTRAINTS		COST ANALYSIS	
High strength stitching for aircraft perso	nnel	A comparison of costs associated with loca	1
restraint systems	A79-33639	actions to reduce aircraft noise impacts	A79-34973
CONTROL		Technical characteristics and cost data fo	
Research and evaluation program on a backu	P	I1-62 and I1-62H aircraft and optimal fl	ight
<pre>control system for gas turbine engines [AD-A064326]</pre>	N79-22107	conditions	A79-35475
Assessment of augmented electronic fuel co	ntrols	Identification of high payoff research for	
for modular engine diagnostics and condi	tion	efficient applicator helicopters in agri-	culture
monitoring [AD-A065128]	N79-23091	and forestry [NASA-CR-152258]	N79-22076
CONTROL EQUIPMENT		COST EFFECTIVEBESS	
NC equipment spurs blisk manufacture - Ful		Cost-effective production of flight vehicle by the pressure and flow-pressure process	
production slated Numerical Control integrated helicopter compressor blade a		Dy the pressure and from-pressure process	A79-32305
manufacture		Reconomical processing of fiber-reinforced	
CONTROL SIMULATION	A79-33589	components with thermal expansion moldin CFRP structures for aircraft aileron	g
Beacon-based collision avoidance system -		[DGLR PAPER 79-011]	A79-32307
Experimental results		Pewer controls, easier inspection - Diffus	10n
Factors in evaluating the effectiveness of	A79-33606	bonding shows cost advantages	A79-33591
collision avoidance logic	u .	COST ESTIBATES	M75 55551
ml	A79-33607	An appraisal of models used in life cycle	cost
Threat logic for air-derived CAS Colli Avoidance System	Sion	estimation for USAF aircraft systems [AD-A064333]	N79-22964
2.01dande 5/50da	A79-33608	COUPLING	2230
CONTROL STABILITY		Advanced coupling development program	N79-22522
Recent progress in active controls applied flutter suppressors	το	[AD-A064296] CRACK PROPAGATION	N/9-22322
•••	A79-32277	Gust spectrum fatigue crack propagation in	
CONTROL THEORY		candidate skin materials	
Radio-engineering tracking systems	A79~35501	CRASHES	A79-33201
CONTROLLABILITY	35501	U.S. Navy developments in crashworthy seat	ıng
A piloted simulator study on augmentation		CREEP RUPTURE STRENGTH	A79-33623
to improve helicopter flying qualities i terrain flight	п	Research on the creep-rupture strength of	
[NASA-TM-78571]	N79-23098	aluminized and nonaluminized jet-engine	turbine
CONVECTION		blades prepared from Nimonic 80A	A79-32586
Thunderstorm turbulence investigations for 1973-1974 in support of the National Sev		CROSS PLOW	A19-32300
Storms Laboratory (NSSL)		Plight investigation of piloting technique	
[AD-A065943]	N79~23604	crosswind limitations using a research t	ype
CONVECTIVE HEAT TRANSFER Measurements of heat transfer in circular,		crosswind landing gear [NASA-TP-1423]	N79-23012
rectangular and triangular ducts, repres	enting	CRYOGENIC WIND TUNNELS	
typical turbine blade internal cooling pusing transient techniques	assages	European transonic wind tunnel project for Reynolds numbers cryogenic proposal	high
[ASME PAPER 79-GT-40]	A79~32343	[AAAP-NT-78-01]	N79-23118
CONVERGENT-DIVERGENT HOZZLES	*****	CUES	
Characteristics of Laval nozzles with gasd	y namic	Motion and force cueing requirements and techniques for advanced tactical aircraf	•
regulation	A79~34650	simulation	•
COOLING SYSTEMS		[AD-A064691]	N79-23102
Introduction to cooling of gas turbine bla	des 1∛79∼22090	CYCLIC LOADS Behavior of adhesively bonded joints under	cyclic
COORDINATES	22030	loading	210110
Influence of gridboard line width and space	ing on	•	N79-23453
windscreen distortion measurements [AD-A065821]	N79~23070		
the more and a			

	DIPPOSION WELDING
D DAMPERS (VALVES)	Pewer controls, easier inspection - Diffusion bonding shows cost advantages
An off-design correlation of part span damper	A79-33591 Concurrent superplastic forming/diffusion bonding
losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A79-32329	of E-1 components N79-23251
DATA ACQUISITION Digital data acquisition system for use in	DIGITAL COMPUTERS A study of embedded computer system software
aircraft engine condition monitoring	acquisition management and recommendations to
[ARL-MECH-ENG-REPT-151] N79-23088 DATA CORRELATION	<pre>improve development visibility [AD-A065879] N79-23681</pre>
A correlation of mixing noise from coannular jets with inverted flow profiles	DIGITAL SIMULATION On some methods for the numerical simulation of
[NASA-TP-1301] N79-22849	flows with complex structure
Buffeting measurements in flight and in a wind tunnel T-33 aircraft	DIGITAL SYSTEMS
[AAAF-NT-78-17] N79-23104 DATA PROCESSING	Advanced application of the MADGE approach aid offshore
Designing, calculating, and manufacturing by means	A79-33457
of data processing computer techniques for mechanical constructions	Digital data acquisition system for use in aircraft engine condition monitoring
A79-32751 A study of embedded computer system software	[ARL-MECH-ENG-REPT-151] N79-23088 DIGITAL TECHNIQUES
acquisition management and recommendations to	Modal analysis of gas turbine buckets using a
improve development visibility [AD-A065879] N79-23681	digital test system [ASME PAPER 79-GT-124] A79-32393
DATA SHOOTHING Kalman filtering and smoothing in Fotonap for	Assessment of augmented electronic fuel controls for modular engine diagnostics and condition
orbit determination using GPS measurements	monitoring
[AD-A064613] N79-22071 DC 10 AIRCRAFT	[AD-A065128] N79-23091 DIMEMSIONAL ANALYSIS
Anatomy of an aircraft accident A79-33644	Similitude, manufacturing, identification, and instrumentation of test models aircraft models
DBICERS The electro-impulse de-icing method aircraft	[AAAF-NT-78-24] N79-23120 DIRECTIONAL ANTENNAS
structures	Optimal excitation of amplitude-direction-finder
[BU-227] N79-23073 DELTA WINGS	antennas operating on the basis of the comparison method
Investigation of the regimes of flow past the upper surfaces of delta wings with shock waves	DIRECTIONAL CONTROL
separated from the leading edges	Development and testing of a dual mode escape propulsion system
Optimization of wing structures to satisfy	A79-33635
strength and frequency requirements A79-35717	DIRECTIVITY Relation between static and in-flight
A numerical solution of supersonic and hypersonic viscous flow fields around thin planar delta wings	directivities of jet noise A79-34585
[AD-A065632] N79-23028 DEMAND (ECONOMICS)	DISPLAY DEVICES
Demand for large freighter aircraft as projected	Advanced Simulator for Pilot Training (ASPT): Aerial refueling visual simulation-engineering
by the NASA cargo/logistics airlift systems studies	[AD-A063283] N79-22118 Comparison of electromechanical and
[AIAA 79-0842] An analysis of long and medium-haul air passenger	cathode-ray-tube display mediums for an instrument approach display
demand, volume 1	[NASA-TM-80069] N79-23080
[NASA-CR-152156] N79-22062 An analysis of short haul air passenger demand,	System description: Aviation Wide-Angle Visual System (AWAVS) Computer Image Generator (CIG)
volume 2 [NASA-CR-152157] N79-22063	visual system [AD-A065060] N79-23683
The impact of changing technology on the demand for air transportation	DISTANCE MEASURING EQUIPMENT The measurement of RF-pulse phase and amplitude in
[NASA-CR-152191] N79-22065	the landing system DLS
DESIGN ANALYSIS Designing, calculating, and manufacturing by means	DISTORTION A79-34608
of data processing computer techniques for mechanical constructions	Influence of gridboard line width and spacing on windscreen distortion measurements
A79-32751 Helicopter emergency escape	[AD-A065821] N79-23070 DITCHING (LARDING)
A79-33626	Inflatable survival systems for helicopters
Very Large Vehicle Conference, Arlington, Va., April 26, 27, 1979, Technical Papers	DOPPLER RADAR
A79-33827 Aerodynamic design and analysis of the AST-200	Thunderstorm turbulence investigations for 1973-1974 in support of the National Severe
supersonic transfort configuration concept [NASA-CR-159051] N79-22046	Storms Laboratory (NSSL)
Active control transport design criteria	DRAG REDUCTION
[PAPER-6663] N79-23065 DIFFUSERS	Subcritical drag minimization for highly swept wings with leading edge vortices
Experimental study on diffusers for mixed-flow machines	N79-22021
[ASME PAPER 78-GT-120] A79-32936	Measurements of heat transfer in circular,
Performance of a vortex-controlled diffuser in an annular swirl-can combustor at inlet Mach	rectangular and triangular ducts, representing typical turbine blade internal cooling passages
numbers up to 0.53 [NASA-TP-1452] N79-22099	using transient techniques [ASME PAPER 79-GT-40] A79-32343
•	DYBANIC CHARACTERISTICS
	Dynamic behavior of aircraft materials [AD-A064592] R79-22078

SUBJECT INDEX ENGINE CONTROL

DYBABIC LOADS	DT LCBOHDDC
— · · · · · · · · · · · · · · · · · · ·	ELASTORERS
Surge-induced structural loads in gas turbines	Elastomer mounted rotors - An alternative for
[ASME PAPER 79-GT-91] A79-32368	smoother running turbomachinery
The electro-impulse de-icing method aircraft	[ASHE PAPER 79-GT-149] A79-32414
structures	BLECTRIC CURRENT
[BU-227] N79-23073	The electro-impulse de-icing method aircraft
DYNABIC MODELS	structures
Identification of a STC1 propulsion plant model	[BU-227] N79-23073
from flight data	BLECTRIC POWER PLANTS
A79-34521	RPV electric power system study. Phase 2: Hot
The fluid dynamic design of advanced centrifugal	bench mockup development
compressors	[AD-A065008] N79-22110
N79-22508	ELECTRIC POWER SUPPLIES
DYWANIC RESPONSE	Closed Brayton cycle system optimization for
The time-variant aerodynamic response of a stator row including the effects of airfoil camber	undersea, terrestrial, and space applications #79-22096
[ASME PAPER 79-GT-110] A79-32385	ELECTRICAL FAULTS
Dynamic behaviour and control of single-shaft	End-to-end testing to verify electrical
closed-cycle gas turbines	equipment failure due to carbon fibers released
N79-22095	in aircraft-fuel fires
DYNABIC STABILITY	N79-22204
Effect of high angles of attack on dynamic	ELECTROCATALYSTS
stability parameters	Catalytic combustion for gas turbine applications
ห79-21997	[ASME PAPER 79-GT-188] A79-32447
DYNAMIC STRUCTURAL ANALYSIS	BLECTROMAGNETIC PULSES
Modal analysis of gas turbine buckets using a	The measurement of RF-pulse phase and amplitude in
digital test system	the landing system DLS
[ASME PAPER 79-GT-124] A79-32393	A79-34608
Optimization of wing structures to satisfy	ELECTROMAGNETIC RADIATION
strength and frequency requirements	Correlation-extremal direction finding of extended
A79-35717	and point sources of electromagnetic oscillations
DYBANIC TESTS	A79-35506
Important factors in the maximum likelihood	Lightning transient research on an F-111E aircraft
analysis of flight test maneuvers	[AD-A063765] N79-22066
[NASA-TP-1459] N79-22113	BLECTRONECHANICAL DEVICES
	Comparison of electromechanical and
E	cathode-ray-tube display mediums for an
-	instrument approach display
BARTH ORBITS	[NASA-TM-80069] N79-23080
User's guide to data preparation: Photogrammetric	Electromechanical actuation development
navigation analysis program Fotonap	[AD-A065734] N79-23101
[AD-A064614] N79-22070	BLECTRONIC CONTROL
BCONORETRICS	Development and testing of a dual mode escape
An analysis of long and medium-haul air passenger	propulsion system
demand, volume 1	A79-33635
[NASA-CR-152156] N79-22062	BLECTRODIC COUNTERNEASURES
An analysis of short haul air passenger demand,	Weapons for the black-box war
volume 2	A79-34824
[NASA-CR-152157] N79-22063	ELECTRONIC EQUIPMENT
An economic model of the manufacturers' aircraft	End-to-end testing to verify electrical
production and airline earnings potential,	equipment farlure due to carbon fibers released in aircraft-fuel fires
volume 3 [NASA-CR-152158] N79-22064	11 allerate lites N79-22204
The impact of changing technology on the demand	
The impact of changing technology on the demand	BLECTRONIC MODULES
for air transportation	BLECTROWIC MODULES Standard Avionics Modules (SAM) for existing modems
for air transportation [NASA-CR-152191] N79-22065	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC FACTORS	BLECTROFIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS
for air transportation [NASA-CR-152191] BCONOMIC PACTORS Adaptation for the economy or adaptation for	BLECTROFIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design	BLECTROFIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A05629] N79-23083 BLECTHOSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978
for air transportation [NASA-CR-152191] N79-22065 BCONONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BJECTION	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 EBERGEBCIES
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A05629] N79-23083 BLECTHOSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978
for air transportation [NASA-CR-152191] N79-22065 BCONONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft	BLECTROFIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSYATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures
for air transportation [NASA-CR-152191] N79-22065 BCOBORIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A05629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611
for air transportation [NASA-CR-152191] BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] RJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGEBCIES Aviation emergency procedures A79-33611 BECLOSURES Aerospace Transparent Materials and Enclosures
for air transportation [NASA-CR-152191] N79-22065 BCONONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A05629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BUCLOSURES Aerospace Transparent Materials and Enclosures (12th)
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGEBCIES Aviation emergency procedures A79-33611 BECLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft	BLECTROFIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065029] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BEBRGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES Aerospace Transparent Materials and Enclosures [12th] [AD-A065049] H19-23066 Helicopter transparent enclosures. Volume 2: A
for air transportation [NASA-CR-152191] BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJUNIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065029] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHBERGENCIES Aviation emergency procedures A79-33611 BUCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BUCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNERGY COBSEBYATION Adaptation for the economy or adaptation for
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065429] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BEBRGENCIES Aviation emergency procedures A79-33611 BECLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNERGI COMSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES Aerospace Transparent Materials and Enclosures [12th] [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNEEGI CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BECLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] BHERGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGY CONVERSION EFFICIENCY
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] RLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BEBRGENCIES Aviation emergency procedures A79-33611 BECLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] RNERGI COMSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGI CONVERSION EPPICIENCY Improving turbine efficiency aerodynamic and
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES Aerospace Transparent Materials and Enclosures [12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] BNEEGI CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGI CONVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJUNIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] RLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BECLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNEEGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] BBERGY CONVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] A79-32436
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AANF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTHOSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNEEGY COBSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-2357 BBERGY CONVERSION EPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] A79-32436 BBERGY DISTRIBUTION
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES Aerospace Transparent Materials and Enclosures [12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] BNERGI CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGI CONVERSION EPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] BNERGI DISTRIBUTION Evaluation of an energy distribution system for
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHBEGENCIES Aviation emergency procedures A79-33611 BNCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNEBGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] BNBERGY CONVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASMP PAPER 79-GT-176] BYBERGI DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAMY-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTHOSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BNBERGY COBSEBVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BBERGET COBVERSION EPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASBE PAPER 79-GT-176] A79-32436 BBERGI DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-23069
for air transportation [NASA-CR-152191] N79-22065 BCOBONIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BBERGEBCIES Aviation emergency procedures A79-33611 BBCLOSURES Aerospace Transparent Materials and Enclosures [12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] BNERGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGY CONVERSION EPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] BNERGY DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] BNERGY TECHNOLOGY
for air transportation [NASA-CR-152191] N79-22065 BCONONIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] RLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BBCLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] RNEEGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] BBERGY CONVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] RNEEGO DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] BNEEGY TECHHOLOGY European scientific notes, volume 32, number 5
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAMY-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system A79-33635 BLASTIC PLATES	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] BLECTHOSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGEBCIES Aviation emergency procedures A79-33611 BECLOSUBES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] M79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] BNEBGY COBSEBVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] BBERGE CONVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] BNEBGY DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] BNEBGY TECHBOLOGY European scientific notes, volume 32, number 5 [AD-A065400] R79-2385
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system A79-33635 BLASTIC PLATES Response of plate to nonstationary random load	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] RLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 RBERGEBCIES Aviation emergency procedures A79-33611 RBCLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] RNERGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] RBERGY CONVERSION RPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] RBERGY DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] RDERGY TRCHMOLOGY European scientific notes, volume 32, number 5 [AD-A065400] RMCHOLOGY ENGINE CONTROL
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC FACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAMY-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system A79-33635 BLASTIC PLATES	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] N79-23083 BLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 BHERGENCIES Aviation emergency procedures A79-33611 BUCLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] N79-23066 Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] N79-23067 BHERGY COBSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAP-NT-77-23] N79-23537 BBERGY COBVERSION EFFICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASHE PAPER 79-GT-176] A79-32436 BUERGI DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-23069 BUERGY TECHBOLOGY European scientific notes, volume 32, number 5 [AD-A065400] BUCUTEDLE Practical 'on-engine' microprocessor control and
for air transportation [NASA-CR-152191] N79-22065 BCONOMIC PACTORS Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] N79-23537 BJECTION Unique crew escape concepts for ATS mission aircraft A79-33636 BJECTION INJURIES Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Mechanism of extremity injuries occurring during ejection from F-4 aircraft A79-33610 An overview of the U.S. Navy Maximum Performance Ejection System A79-33613 BJECTION SEATS Aircrew experiences in USAF ejections, 1971-1977 A79-33609 Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes A79-33616 Ejection systems in the year 2000 A79-33622 Development and testing of a dual mode escape propulsion system A79-33635 BLASTIC PLATES Response of plate to nonstationary random load	BLECTROBIC MODULES Standard Avionics Modules (SAM) for existing modems [AD-A065629] RLECTROSTATICS Suppression of radio-electrical disturbances of electrostatic origin on aircraft A79-34978 RBERGEBCIES Aviation emergency procedures A79-33611 RBCLOSURES Aerospace Transparent Materials and Enclosures (12th) [AD-A065049] Helicopter transparent enclosures. Volume 2: A general specification [AD-A065462] RNERGY CONSERVATION Adaptation for the economy or adaptation for energy conservation passenger aircraft design [AAAF-NT-77-23] RBERGY CONVERSION RPPICIENCY Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines [ASME PAPER 79-GT-176] RBERGY DISTRIBUTION Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] RDERGY TRCHMOLOGY European scientific notes, volume 32, number 5 [AD-A065400] RMCHOLOGY ENGINE CONTROL

ENGINE COOLANTS SUBJECT INDEX

ENGINE COOLANTS	BHVIROBHENT EPPECTS
Measurements of heat transfer in circular,	Study of installed environment of various
rectangular and triangular ducts, representing	equipments in military aircraft
typical turbine blade internal cooling passages	A79-33460
using transient techniques	Environmental effects on VLP navigation systems,
[ASME PAPER 79-GI-40] A79-32343 BNGINE DESIGN	ONEGA [AD-A063882] N79-22073
An application of 3-D viscous flow analysis to the	BHVIROHBBT HODBLS
design of a low-aspect-ratio turbine	FAA proposes that the standard noise model be the
[ASME PAPER 79-GT-53] A79-32348	integrated noise model /INM/
Aerodynamic design of fixed and variable geometry nozzleless turbine casings	A79-34975 ENVIRONMENTAL SURVEYS
[ASME PAPER GT-87] A79-32364	Perspectives on airport environmental
Elastomer mounted rotors - An alternative for	compatibility; Proceedings of the
smoother running turbomachinery	Economic/Environmental Specialty Conference,
[ASME PAPER 79-GT-149] A79-32414 The growth and evolution of the TPE331	Hiami, Fla., Harch 2, 3, 1978 A79-34971
[ASME PAPER 79-GT-164] A79-32426	Airport noise control and land use compatibility
Improving turbine efficiency aerodynamic and	study
stress analyses for gas turbine engines	A79-34972
[ASME PAPER 79-GT-176] A79-32436 A design review of ceramic components for turbine	EROSION Erosion resistant clad rotor blades - Boride
engines	coatings do the job
[ASME PAPER 79-GT-183] A79-32442	A79-33590
Propulsion system considerations for the subsonic	Turbine blades: Erosion and Corrosion. Citations
V/STOL	from the NTIS data base
[ASME PAPER 78-GT-57] A79-32934 F101 engine derivative work advances	[NTIS/PS-79/0148/1] N79-22111 Turbine blades: Erosion and Corrosion. Citations
A79-34600	from the Engineering Index data base
Solution of boundary value problems for the	[NTIS/PS-79/0149/9] N79-22112
vibration equation for a jet engine model	BERGE ANALYSIS
A79-35895 Advanced composite engine rotor design	Error analysis of a satellite interferometer navigation system
[AD-A063843] N79-22105	[NASA TASK 3] A79-35097
Hydrazine monopropellant reciprocating engine	Error model verification for a three axis laser
development	gyro strapdown inertial measurement unit
Warnahla arala angina taghnalaga magana planasa	[AD-A064047] N79-22072
Variable cycle engine technology program planning and definition study	BSCAPE SYSTEMS Alrerew experiences in USAF ejections, 1971-1977
[NASA-CR-159539] N79-23084	A79-33609
ENGINE INLETS	Aerodynamic effects simulator for testing
Engine evaluation of a vibration damping treatment	aircraft escape systems
for inlet guide vanes [ASME PAPER 79-GT-163] A79-32425	A79-33617 Development and initial test results of parachutes
Solution of boundary value problems for the	with Automatic Inflation Modulation /A.I.M./
vibration equation for a jet engine model	A79-33618
ENGINE NOISE	Ejection systems in the year 2000 A79-33622
Quieter short and medium haul aircraft	Helicopter emergency escape
A79-34921	A79-33626
Engine integration and noise considerations for	Development and testing of a dual mode escape
STOL aircraft N79-23005	propulsion system A79-33635
ENGINE STARTERS	Unique crew escape concepts for ATS mission aircraft
Starting torque characteristics of small aircraft	A79-33636
gas turbines and APU's	An experimental passive microwave attitude
[ASME PAPER 79-GT-95] A79-32371 ENGINE TESTING LABORATORIES	measurement system for escape system steering A79-33637
Afterbody tests in the Modane hot gas bench	Death by misadventure helicopter escape system
[AAAF-NT-78-10] N79-23095	proposals
BUGINE TESTS	A79-33640
A low cost, on-site performance monitoring system thermodynamics of shaft power gas turbines	BUROPEAN AIRBUS Britain's better airbus wing A-310 aircraft
[ASME PAPER 79-GT-21] A79-32334	wing design
Engine evaluation of a vibration damping treatment	A79-34823
for inlet guide vanes	RVALUATION
[ASME PAPER 79-GT-163] A79-32425 The effect of a sample lot of fuel JECTORS on	Basis for an objective evaluation of the paratroop jumping reliability
emissions levels of a small gas turbine	A79-33619
[ASME PAPER 79-GT-165] A79-32427	BVOLUTION (DEVELOPMENT)
Identification of a STOL propulsion plant model	The growth and evolution of the TPE331
from flight data A79-34521	[ASME PAPER 79-GT-164] A79-32426 BEHAUST FLOW SIMULATION
F101 engine derivative work advances	Wind tunnel model study of the hot exhaust plume
A79-34600	from the compressor research facility at
Assessment of augmented electronic fuel controls	Wright-Patterson Air Force Base, Ohio
for modular engine diagnostics and condition	[ASME PAPER 79-GT-186] A79-32445 EXHAUST GASES
monitoring [AD-A065128] N79-23091	Wind tunnel model study of the hot exhaust plume
Optical flow measurements: Applications to wind	from the compressor research facility at
tunnels or motor bench tests	Wright-Patterson Air Force Base, Ohio
[AAAF-NT-78-07] N79-23117 ENGINES	[ASME PAPER 79-GT-186] A79-32445 Characteristic time correlations of pollutant
Variable cycle engine technology program planning	emissions from an annular gas turbine combustor
and definition study	of aircraft engines
[NASA-CR-159539] N79-23084	[ASBE PAPER 79-GT-194] A79-32452
	F-100 turbine engine afterburner emission tests [AD-A063789] N79-22109

SUBJECT INDEX PIRE PREVENTION

Effect of primary-zone equivalence ratio on	Helicopter fatigue. A review of current
pollutant formation [NASA-TP-1463] N79-23086	requirements and substantiation procedures [AGARD-R-674] #79-23074
EXTERNAL STORES In-flight captive store loads compared with wind-tunnel and mathematical simulations	US Army helicopter fatigue requirements and substantiation procedures 879-23075
A79-34595	Helicopter fatigue evaluation. The UK approach
An investigation into the pressure distributions over a wing and store combination at low speeds [BU-226] N79-23047	#79-23076 Fatigue life estimation methods for helicopter structural parts
F	N79-23077 Present fatigue analysis and design of helicopters requirements and qualification procedures
P-4 AIRCRAFT Mechanism of extremity injuries occurring during	PATIGUE TESTS N79-23078
ejection from F-4 aircraft	Fatigue of helicopters: Service life evaluation method
F-8 AIRCRAFT Computer program to calculate three-dimensional	PEASIBILITY ANALYSIS N79-23079
boundary layer flows over wings with wall mass transfer	Peasibility demonstration of a vertical seeking seat steering system
[NASA-CR-3123] N79-23016	A79-33614
Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems	Extended analytical study of the free-wing/free-trimmer concept
[NASA-CR-3089] N79-23099 P-14 AIRCRAPT	[NASA-CR-3135] N79-22040
P101 engine derivative work advances	PREDBACK CONTROL The role of the backside parameter in height control
A79-34600	A79-34522
P-16 AIRCRAFT P101 engine derivative work advances A79-34600	Nonlinear stochastic control design for gas turbine engines [AD-A065075] N79-22103
Design guidelines for the application of forebody	FIBER COMPOSITES
and nose strakes to a fighter aircraft based on F-16 wind tunnel testing experiment N79-22000	<pre>Economical processing of fiber-reinforced components with thermal expansion molding CFRP structures for aircraft aileron</pre>
P-100 AIRCRAFT	[DGLR PAPER 79-011] A79-32307
F-100 turbine engine afterburner emission tests [AD-A063789] N79-22109 F-111 AIRCRAFT	<pre>FIBER OPTICS Applicability of fiber optics to aircraft fire detection systems</pre>
Lightning transient research on an F-111E aircraft	[AD-A063974] N79-22882
[AD-A063765] N79-22066 FABRICATION Cost-effective production of flight vehicle shells	<pre>FIBBR STRBMGTB High strength stitching for aircraft personnel restraint systems</pre>
by the pressure and flow-pressure processes	A79-33639
[DGLE PAPER 79-008] Economical processing of fiber-reinforced components with thermal expansion molding	FIGHTER AIRCRAPT Unique crew escape concepts for ATS mission aircraft A79-33636
CPRP structures for aircraft aileron [DGLR PAPER 79-011] A79-32307	An experimental passive microwave attitude measurement system for escape system steering
Economical processing for the fabrication of CFRP components	High angle of attack aerodynamics
[DGIR PAPER 79-009] A79-33600	[AGARD-CP-247] N79-21996
Development of hermetically sealed low-maintenance high-density packaging for ejection seat-mounted personnel parachutes	High angle of attack characteristics of different fighter configurations N79-21998
A79-33616 Advanced fabrication processes	Aerodynamic characteristics of a fighter-type configuration during and beyond stall
[AGARD-CP-256] N79-23236	N79-22003
Pabrication of titanium at high temperatures N79-23252	Prediction of lateral aerodynamic loads on aircraft at high angles of attack
PABRICS	N79-22024
High strength stitching for aircraft personnel restraint systems A79-33639	Intake design and intake/airframe integration for a post-stall fighter aircraft concept N79-22027
PAILURE ABALTSIS	Wind tunnel test at low speeds of a dorsal air
Correlation study between vibrational environmental and failure rates of civil	intake on a fighter configuration N79-22029
helicopter components [NASA-CR-159033] N79-23064	FILM COOLING Account of film turbulence for predicting film
The electro-impulse de-icing method aircraft structures	cooling effectiveness in gas turbine combustors [ASME PAPER 79-GT-200] A79-32457
[BU-227] Failures in adhesively bonded structures N79-23454	PINITE BLEMBHT METHOD Designing, calculating, and manufacturing by means
PAR FIBLDS The derivation of a thickness noise formula for	of data processing computer techniques for mechanical constructions A79-32751
the far-field by Isom applied to helicopter rotors	Some observations on the local instability of orthotropic structural sections
PASTEBERS A79-35449	A79-33461 A finite element approach to subsonic aerodynamics
An evaluation of coatings for steel and titanium alloy fasteners for aircraft applications	PIRE PIGHTING
PATIGUE LIFE N79-23242	CFR Vehicle design and performance objectives Crash Fire Rescue
Gust spectrum fatique crack propagation in candidate skin materials	FIRE PREVENTION
A79-33201	Preventing fires in airport fuel systems A79-34923

PIRES SUBJECT INDEX

Applicability of fiber optics to aircraft	fire	STOL Technology, volume 2	
detection systems		[VKI-LECTURE-SERIES-60-VOL-2]	N79-23002
[AD-A063974] PIRES	N79-22882	FLIGHT PATHS A special extension of the General Point	
End-to-end testing to verify electrica	1	Performance Equation for flight path	s
equipment failure due to carbon fiters r	celeased	Police to the later are political as manufable	A79-35926
in aircraft-fuel fires	N79-22204	Radar track data correlation or reachable revisited: The reachable state	sets
Ignition of fuel sprays by hot surfaces an		[AD-A065045]	N79-23318
stabilization of aircraft fires		PLIGHT PLANS	4070
[AD-A065153] FLAME HOLDERS	พ79-23181	Air France's Paris-Tokyo transpolar flight	1n 1978 A79-32583
Lo-frequency augmentor instability investi	ıqatıon	PLIGHT RULES	
computer program user's manual		Takeoff and landing ground rules	man 02004
[AD-A065774] FLEXIBLE BODIES	N79-23093	PLIGHT SAPETY	N79-23001
Laser balancing demonstration on a high-sp	peed	Aircrew experiences in USAF ejections, 197	1-1977
flexible rotor			A79-33609
[ASME PAPER 79-GT-56] PLIGET CHARACTERISTICS	A79-32351	Basis for an objective evaluation of the p jumping reliability	aratroop
Identification of a STOL propulsion plant	model		A79-33619
from flight data	170 24524	FLIGHT SIMULATION	100
Technical characteristics and cost data for	A79-34521 or the	Special Ground testing facilities and test techniques for STOL aircraft	1119
I1-62 and I1-62M aircraft and optimal fl		-	N79-23007
conditions	170 1CH7C	A piloted simulator study on augmentation to improve helicopter flying qualities i	
Behavior of a transport aircraft with a hi	A79-35475	terrain flight	
aspect ratio wing at a high angle of inc	cidence	[NASA-TM-78571]	N79-23098
Programme desire test 1 Proban William adv	N79-22005	Motion and force cueing requirements and techniques for advanced tactical alicial	+
Engineer design test 1, Hughes YAH-64, adv attack helicopter	vanceu	simulation	•
[AD-A064359]	N79-22077	[AD-A064691]	N79-23102
Flight dynamics problems with STOL operati	LOB พ79-23003	FLIGHT SIMULATORS Simulators cutting the fuel bill revie	w of
A study of the Sheriff's wing	177 25005	airline, military, general aviation and	
[BU-215]	N79-23072	trainers	170 22750
A piloted simulator study on augmentation to improve helicopter flying qualities in		Advanced Simulator for Pilot Training (ASP	A79-32750 T):
terrain flight		Aerial refueling visual simulation-engin	eering
[NASA-TH-78571]	N79-23098	[AD-A063283]	N79-22118
The role of the backside parameter in heigh	ht control	PLIGHT STABILITY TESTS Alroraft response to lateral gusts- Explor	atory
	A79-34522	study	
Lightning transient research on an F-111E	N79-22066	FLIGHT TESTS	A79-32278
[AD-A063765] Advanced flight control actuation system	1173-22000	In-flight captive store loads compared wit	h
(AFCAS-F/P): Peasibility investigation		wind-tunnel and mathematical simulations	
electro/pneumatic dual power driven conc [AD-A063992]	rept N79-22114	Important factors in the maximum likelihoo	A79-34595 d
Application of model algorithmic control t		analysis of flight test maneuvers	
lightly damped single input single output		[NASA-TP-1459] Plight investigation of piloting technique	N79-22113
[AD-A064222] Flight dynamics problems with STOL operations of the state of the stat	N79-22115	crosswind limitations using a research t	
· · · · · · · · · · · · · · · · · · ·	N79-23003	crosswind landing gear	
Investigation of the Multiple Method Adapt Control (MMAC) method for flight control		[NASA-TP-1423] Stabilized Terrain Optical Position Sensor	N79-23012
[NASA-CR-3089]	N79-23099	flight test report	(51015)
Flight evaluation MK 2 integrated control	ler	[AD-A065018]	N79-23100
installed in an CH-58A helicopter [AD-A065072]	N79-23103	Buffeting measurements in flight and in a tunnel T-33 aircraft	Wind
FLIGHT CREWS		[AAAF-NT-78-17]	N79-23104
Alicrew experiences in USAF ejections, 197	71-1977 A79-33609	PLOATS Inflatable survival systems for helicopter	s
Unique crew escape concepts for ATS mission		THIS CODE DELITICE DISCOMO TOT MOTICOPULE	a79-33624
	A79-33636	PLOW CHARACTERISTICS	t ha
High strength stitching for aircraft personestraint systems	onuer	Investigation of the regimes of flow past upper surfaces of delta wings with shock	
reservation by account	A79-33639	separated from the leading edges	
Test and evaluation of modified high perfo	ormance	Parameters of three-dimensional flow past	A79-35110
jet aircrew life preserver [AD-A063959]	N79-22067	near the free surface of a ponderable fl	
Definition of requirements for a performan	nce		A79-35155
measurement system for C-5 aircrew membe [AD-A063282]	ers N79-22119	FLOW DIRECTION INDICATORS Miniature flow-direction and airspeed sens	or for
FLIGHT HAZARDS	117 22 113	airplanes and radio controlled models in	
Measurement of ozone in an aircraft	170-30025	studies	#70-22004
FLIGHT INSTRUMENTS	A79-34925	[NASA-TP-1467] PLOW DISTORTION	N79-23081
Comparison of electromechanical and		A general solution for distorted flows in	cascades
cathode-ray-tube display mediums for an		of aerofoils	170_222E2
instrument approach display [NASA-TM-80069]	N79-23080	[ASMY PAPER 79-GT-65] The prediction of steady, circumferential	A79-32353 pressure
PLIGHT MECHANICS		and temperature distortions in multistag	
STOL Technology, volume 2	N79-23002	flow compressors [ASME PAPER 79-GT-184]	A79-32443
[VKI-LECTUBE-SERIES-60-VCL-2] PLIGHT OPERATIONS	23002	Cuping survey to at 1041	3.7 32773
Air France's Paris-Tokyo transpolar flight			
	A79-32583		

SUBJECT INDEX PREE FLIGHT TEST APPARATOS

The efforts of document and operating warrab	les en	The priming of a wind tunnel with a hydrau	?rc
The effects of design and operating variable the response of an axial flow fan to inledistortions		compressor	N79-23108
[NASA-CR-158522]	N79-22087	PLUID EBCHANICS	177 23100
An experimental study of the response of a		Surge-induced structural loads in gas turb	1 Des
turbo-machine rotor to a low frequency is		[ASBE PAPER 79-GT-91]	A79-32368
distortion		PLUIDICS	
[AD-A064776]	N79-23089	Research and evaluation program on a backu	P
FLOW DISTRIBUTION		control system for gas turbine engines	
Experimental study on diffusers for mixed-	flow	[AD-A064326]	N79-22107
machines		PLOTTER ANALYSIS	_
[ASME PAPER 78-GT-120]	A79-32936	Recent progress in active controls applied	to
A correlation of mixing noise from coannula	ar jets	flutter suppressors	170 2227
with inverted flow profiles [NASA-TP-1301]	N79-22849	Study of compressor aeroelastic instabilit:	A79-32277
Comparison of store trajectory and aerodyna		linear cascade wind tunnel	res in a
loads, and model flow-field characterist:		[ONERA, TP NO. 1979-6]	A79-32296
obtained in the AEDC PWT/4T and VFK/A will		Dynamic identification of light aircraft	
tunnels at Mach number 1.63		structures and flutter certification	
[AD-A065137]	N79-23017	[ONERA, TP NO. 1979-31]	A79-32302
Development of a viscous vortex/wing intera	action	Merodynamic and aeroelastic characteristics	
program for thick wings with bounded lead		oscillating loaded cascades at low Mach	
[AD-A065181]	N79-23020	[ASME PAPER 79-GT-112]	A79-32387
A numerical solution of supersonic and hype		An analysis of aeroengine fan flutter usin	g twin
Viscous flow fields around thin planar de	erta wings N79-23028	orthogonal vibration modes [ASME PAPER 79-GT-126]	A79-32395
[AD-A065632] Wall interference effects	N/3-23026	PLY BY WIRE CONTROL	813-32333
wall intellelence effects	N79-23113	Active control transport design criteria	
PLOW BQUATIONS		[PAPER-6663]	N79-23065
On some methods for the numerical simulation	on of	FLYING EJECTION SHATS	
flows with complex structure		An overview of the U.S. Navy Maximum Perfo	rmance
·	A79-34691	Ejection System	
Solution of boundary value problems for the			A79-33613
vibration equation for a jet engine mode:		Peasibility demonstration of a vertical se-	eking
lwish flow tumberes flowletters and	A79-35895	seat steering system	A79-33614
Axial flow turbines flow relations and	N79-22092	Vertical-seeking autopilot design of t	
PLOW MEASUREMENT	N73-22032	vector controlled ejection seat	ar as c
Optical flow measurements: Applications to	o wind	Total description of outside the second	A79-33615
tunnels or motor bench tests		Aerodynamic effects simulator for test:	ing
[AAAF-NT-78-07]	N79-23117	alrcraft escape systems	
PLOW STABILITY	_		A79-33617
Some experimental results connected with the	he	POG DISPERSAL	
transonic instabilities on an airfoil	A79-32671	A modern thermo-kinetic warm fog dispersal [AD-A064428]	N79-23595
Performance of a wortex-controlled diffuser		FORCE DISTRIBUTION	873-23333
annular swirl-can combustor at inlet mach		Notes concerning testing time requirements	10
numbers up to 0.53	-	steady and unsteady measurements	
[NASA-TP-1452]	N79-22099		N79-23112
FLOW THEORY		FORCED VIBRATION	
Transonic flows in turbomachinery. Volume	1:	Forced vibrations of a single stage axial	
Theory, part 2	****	compressor rotor	.70 22202
[VKI-LECTURE-SERIES-59-1-PT-2]	N79-23425	[ASHE PAPER 79-GT-108] PORESTS	A79-32383
The Drediction of steady groundscential	Processes	Identification of high payoff research for	BOEG
The prediction of steady, circumferential pand temperature distortions in multistage		efficient applicator helicopters in agric	
flow compressors	c dridi	and forestry	
[ASME PAPER 79-GT-184]	A79-32443	[NASA-CR-152258]	N79-22076
PLOW VISUALIZATION		PORGING	
Low-turbulence high-speed wind tunnel for t	the	Design, fabrication, and evaluation of GAT	ORIZED
determination of cascade shock losses		(trade name) ceramic-wrought alloy attac	hment
[ASHE PAPER 79-GI-129]	179-32398	concepts for gas turbine engines	N70 00400
Visualisations and calculations of air into		[AD-A064597] PORMING TECHNIQUES	N79-22102
high angles of attack and low Reynolds no	umber	Cost-effective production of flight vehicle	e challe
Navier-Stokes equation	N79-22030	by the pressure and flow-pressure process	
PLOUBETERS	22030	[DGLR PAPER 79-008]	A79-32305
Advanced technology fuel mass flowmeter		Concurrent superplastic forming/diffusion	bonding
[AD-A063963]	N79-22108	of F-1 components	
PLUID DYNAMICS			N79-23251
Performance estimation of partial admission		PORWARD SCATTERING	
[ASME PAPER 79-GT-123]	179-32392	Forward scatter meter measurements of slan	t Visual
The fluid dynamic design of advanced central compressors	TINGAL	range [AD-A064429]	N79-23062
	N79-22508	PRACTURE MECHANICS	25002
FLUID FILES		An integrated fault-tolerant avionics system	em
Oil squeeze film dampers for reducing with	ation of	concept for advanced aircraft	
aircraft gas turbine engines		[AD-A065136]	N79-23082
[ASME PAPER 79-GT-133]	A79-32402	FREE BOUNDARIES	
PLUID PLOW		Parameters of three-dimensional flow past	
Experimental study on diffusers for mixed-	ITOM	near the free surface of a ponderable fl	
machines [ASMP DADED 78_cm_120]	179-32024	PREE FLIGHT TEST APPARATUS	A79-35155
[ASME PAPER 78-GT-120] Parameters of three-dimensional flow past a	A79-32936	An exploratory investigation of quasi-free	flving
near the free surface of a ponderable flu		models in a supersonic short-duration will	
The fact of the state of a position of the	A79-35155	The state of the s	A79-35925
Axial flow turbines flow relations and			
	ทวี9-22092		

FREE WING AIRCRAFT SUBJECT INDEX

PREE WING AIRCRAFT		A general solution for distorted flows in cascades
Extended analytical study of the free-wing/free-trimmer concept		of aerofoils [ASME PAPER 79-GT-65] A79-32353
	N79-22040	Surge-induced structural loads in gas turbines
PREQUENCY RESPONSE		[ASME PAPER 79-GT-91] A79-32368
Lifting surface approach to the estimation	of gust	Starting torque characteristics of small aircraft
response of finite wings	A79-34596	gas turbines and APU's [ASME PAPER 79-GT-95] A79-32371
PRICTION FACTOR	A73 34330	An experimental study of endwall and airfoil
Friction damping of resonant stresses in ga	as	surface heat transfer in a large scale turbine
turbine engine airfoils	-50 2025	blade cascade
[ASME PAPER 79-GT-109] FROST	A79-32384	[ASME PAPER 79-GT-99] A79-32375
Frost formation on an airfoil: A mathemati	ical	<pre>Friction damping of resonant stresses in gas turbine engine airfoils</pre>
model 1		[ASME PAPER 79-GT-109] A79-32384
[NASA-CR-3129]	N79-22706	Nuclear Bi-Brayton system for aircraft propulsion
PUBL COMBUSTION	.1	[ASME PAPER 79-GT-119] A79-32389
The combustion of a range of distillate fue small gas turbine engines	512 III	Oil squeeze film dampers for reducing vibration of aircraft gas turbine engines
[ASME PAPER 79-GT-175]	A79-32435	[ASME PAPER 79-GT-133] A79-32402
Fuel property effects on combustor performa		A review of small gas turbine combustion system
aircraft synthetic and petroleum-derived		development
[ASME PAPER 79-GT-178]	A79-32438	[ASME PAPER 79-GT-136] A79-32405
Catalytic combustion for gas turbine applic [ASME PAPER 79-GT-188]	A79-32447	The effect of a sample lot of fuel JECTORS on emissions levels of a small gas turbine
FUEL CONSUMPTION		[ASME PAPER 79-GT-165] A79-32427
Adaptation for the economy or adaptation for		The combustion of a range of distillate fuels in
energy conservation passenger aircraf		small gas turbine engines
[AAAF-NT-77-23] FUEL CONTROL	N79-23537	[ASME PAPER 79-GT-175] A79-32435
Practical 'on-engine' microprocessor contro	ol and	Improving turbine efficiency aerodynamic and stress analyses for gas turbine engines
monitoring systems for gas turbines		[ASME PAPER 79-GT-176] A79-32436
[ASME PAPER 79-GT-181]	A79-32440	Practical 'on-engine' microprocessor control and
PUBL INJECTION		monitoring systems for gas turbines
The effect of a sample lot of fuel JECTORS emissions levels of a small gas turbine	on	[ASME PAPER 79-GT-181] A79-32440 A design review of ceramic components for turbine
[ASME PAPER 79-GT-165]	A79-32427	engines
FUEL SPEAYS		[ASME PAPER 79-GT-183] A79-32442
Ignition of fuel sprays by hot surfaces and	1	Catalytic combustion for gas turbine applications
stabilization of aircraft fires	W70 23404	[ASME PAPER 79-GT-188] A79-32447
[AD-A065153] FUEL SYSTEMS	N79-23181	Characteristic time correlations of pollutant emissions from an annular gas turbine combustor
Advanced technology fuel mass flowmeter		of aircraft engines
[AD-A063963]	N79-22108	[ASME PAPER 79-GT-194] A79-32452
FUEL TANKS		Account of film turbulence for predicting film
Preventing fires in airport fuel systems	170 24022	cooling effectiveness in gas turbine combustors
FUEL TESTS	A79-34923	[ASME PAPER 79-GT-200] A79-32457 Selected problems concerning unstable operation of
The effect of a sample lot of fuel JECTORS	on	aircraft turbine engine compressors
emissions levels of a small gas turbine		A79-32589
[ASNE PAPER 79-GT-165]	A79-32427	Damping capacity of paired shrouded turbine blades
Fuel property effects on combustor performa aircraft synthetic and petroleum-derived		in relation to shroud contact conditions A79-32827
[ASME PAPER 79-GT-178]	A79-32438	Measurement of heat-transfer rate to a gas turbine
FUBL-AIR RATIO		stator
Preventing fires in airport fuel systems	-70 34003	[ASHE PAPER 78-GT-119] A79-32935
	A79-34923	Formation of sooty particles in combustion
G		chambers with series injection of air into the combustion zone
G		A79-34550
GAS BEARINGS		Characteristics of Laval nozzles with gasdynamic
Operating characteristics of a cantilever-m		regulation
resilient-pad gas-lubricated thrust beari [NASA-TP-1438]	N79-22518	A79-34650 Tests of NASA ceramic thermal barrier coating for
GAS DYNAMICS	1175 12510	gas-turbine engines
Characteristics of Laval mozzles with gasdy	ynamic	A79-34996
regulation	-70 24650	Design, fabrication, and evaluation of GATORIZED
GAS FLOW	A79-34650	(trade name) ceramic-wrought alloy attachment
Hypersonic viscous shock layer on infinite-	-span	concepts for gas turbine engines [AD-A064597] N79-22102
arrow wings at angle of attack		F-100 turbine engine afterburner emission tests
	A79-35158	[AD-A063789] N79-22109
An experimental study of the response of a	. 1 - 4	The trajectories of spherical particles in flow
turbo-machine rotor to a low frequency in distortion	itet	through cascaded turning vanes [BU-220] N79-23096
[AD-A064776]	N79-23089	GAS TURBINES
GAS TEMPERATURE		Modal analysis of gas turbine buckets using a
A low cost, on-site performance monitoring		digital test system
thermodynamics of shaft power gas tur		[ASME PAPER 79-GT-124] A79-32393
[ASME PAPER 79-GT-21] GAS TURBINE ENGINES	A79-32334	Thermal influences in gas turbine transients - Effects of changes in compressor characteristics
A low cost, on-site performance monitoring	system	[ASME PAPER 79-GT-143] A79-32409
thermodynamics of shaft power gas tur	Dines	Wind tunnel model study of the hot exhaust plume
[ASME PAPER 79-GT-21]	A79-32334	from the compressor research facility at
An application of 3-D viscous flow analysis design of a low-aspect-ratio turbine	to the	Wright-Patterson Air Force Base, Ohio [ASME PAPER 79-GT-186] A79-32445
	A79-32348	The flow past a supersonic trailing edge in
<u> </u>		transonic turbine cascades
		A79-32670

SUBJECT INDEX BELICOPTER PERFORMANCE

The flow through low cambered transonic tur	tprue	Н	
cascade	N79-22089		
Introduction to cooling of gas turbine blad		HANDBOOKS Relicopter transparent enclosures. Volume	1:
Aerodynamic problems in cooled turbine blad design for small gas turbine		Design handbook [AD-A065268]	N79-23068
Closed Cycle Gas Turbines	N79-22091	HARDBESS High strength statching for aircraft perso	nnel
[VKI-LECTURE-SERIES-24] Closed power cycles' analysis	N79-22093	restraint systems	A79-33639
	N79-22094	HAZARDS	
Dynamic behaviour and control of single-sha closed-cycle gas turbines	n79-22095	An assessment of local risk to area as with commercial operations of aircraft w graphite fiber composite structures	
Closed Brayton cycle system optimization fo undersea, terrestrial, and space applicat		Carbon Piber Risk Analysis: Conclusions	N79-22207
	N79-22096	•	N79-22209
Calculation and design of closed cycle help turbines for high temperature reactors	1111	BEAT MEASUREMENT Measurements of heat transfer in circular,	
tarban and magnitude to a contract to the cont	N79-22098	rectangular and triangular ducts, repres	
Research and evaluation program on a backup	P	typical turbine blade internal cooling p	assages
control system for gas turbine engines [AD-A064326]	N79-22107	using transient techniques [ASME PAPER 79-GT-40]	A79-32343
Advanced technology fuel mass flowmeter	.,, 22.0.	Measurement of heat-transfer rate to a gas	
[AD-A063963]	N79-22108	stator	170 22026
GENERAL AVIATION AIRCRAFT General aviation IFR operational problems	w70 00000	[ASBE PAPER 78-GT-119] HEAT BESISTABT ALLOYS	A79-32935
[NASA-CR-159022] GRODESY	N79-22068	Design, fabrication, and evaluation of GAT (trade name) ceramic-wrought alloy attac	
Geodesy and coordinate conversion for posit	tion	concepts for gas turbine engines	
determination of aircraft	170 22504	[AD-A064597]	N79-22102
GEODETIC COORDINATES	A79-32581	Heat treatment of P/M nickel-base superall turbine disks	oys for
Geodesy and coordinate conversion for posit	tion	44.55.00	N79-23254
determination of aircraft	A79-32581	BEAT TRANSPER	. 1
GLIDERS	8/9-32561	An experimental study of endwall and airfo surface heat transfer in a large scale t	
The powered glider, SZD-45% Ogar	A79-32584	blade cascade [ASME PAPER 79-GT-99]	A79-32375
A method for the optimal layout of driving mechanisms of the aileron for gliders and		HEAT TRANSPER COEPFICIENTS Measurement of heat-transfer rate to a gas	
motorplanes		stator	
GLOBAL POSITIONING SYSTEM	A79-35921	[ASME PAPER 78-GT-119] HELICOPTES CONTEOL	A79-32935
Kalman filtering and smoothing in Potonap f orbit determination using GPS measurement		A flyable suspended model helicopter for t investigation of the human pilot behavio	
[AD-A064613]	N79-22071	investigation of the number prior behavio	A79-35923
GOVERBREETS		A piloted simulator study on augmentation	
Active control transport design criteria [PAPER-6663]	N79-23065	to improve belicopter flying qualities i terrain flight	n
GRAPHITE		[NASA-TH-78571]	N79-23098
An assessment of local risk to area ass with commercial operations of aircraft wi		REVICENTER DESIGN Review of problems of unsteady aerodynamic	s of
graphite fiber composite structures	N79-22207	helicopters	A79-32293
GRAPHITE-EPOIT COMPOSITE MATERIALS		Experimental analysis of V.H.F. antennas f	
Dynamic behavior of aircraft materials	N70 22070	helicopter homing systems using scale-mo	del
[AD-A064592] Carbon fibers and composites	N79-22078	techniques	A79-34392
-	N79-22199	Predesign of the second generation compreh	
Source of released carbon fibers	N79-22200	helicopter analysis system	N79-22084
GROUND BASED CONTROL	N73-22200	[AD-A064289] Helicopter fatigue. A review of current	N/3-22004
Conflict alert for the air traffic control		requirements and substantiation procedur	es
GROUND EFFECT MACHINES	A79-33605	[AGARD-R-674] Present fatigue analysis and design of hel	N79-23074
Large wing-in-ground effect transport aircr	aft	requirements and qualification procedure	
[AIAA 79-0845]	A79-33830		N79-23078
GUIDE VARES Engine evaluation of a vibration damping tr	catmont	HELICOPTER ENGINES NC equipment spurs blisk manufacture - Ful	l-scale
for inlet guide vanes	.cacmene	production slated Numerical Control	
[ASME PAPER 79-GT-163]	A79-32425	integrated helicopter compressor blade a	nd dısk
GUST LOADS Aircraft response to lateral gusts- Explora	atory	manufacture	A79-33589
study	•	US Army helicopter fatigue requirements an	
	A79-32278	substantiation procedures	
Gust spectrum fatigue crack propagation in candidate skin materials		HELICOPTEE PERFORMANCE	N79-23075
	A79-33201	Inflatable survival systems for helicopter	
Lifting surface approach to the estimation	of gust	Polygonton operations asserts	A79-33624
response of finite wings	A79-34596	Helicopter emergency escape	A79-33626
		The derivation of a thickness noise formul	a for
		the far-field by Isom applied to hel	ıcopter
		rotors	A79-35449

BELICOPTERS SUBJECT INDEX

Patigue of helicopters: Service life evalua	tion	HOT-WIRE PLOWERTERS	_
method	79-23079	Preliminary studies using photon correlation velocimetry in turbomachinery and combust	
HELICOPTERS	7,5 2,507,5	systems	1011
Rotary-wing aerodynamics. Volume 1: Basic			A79-34314
theories of rotor aerodynamics with applic		BOVERING	
to helicopters momentum, vortices, and		Stabilized Terrain Optical Position Sensor	(STOPS)
potential theory [NASA-CR-3082] N	79-22039	flight test report [AD-A065018]	N79-23100
Identification of high payoff research for m		HOBAN FACTORS ENGINEERING .	1175 25100
efficient applicator helicopters in agricu		U.S. Navy developments in crashworthy seati	ng
and forestry			A79-33623
	79-22076	HUMAN PERFORMANCE	
The predesign phase of the second-generation		Definition of requirements for a performanc measurement system for C-5 aircrew member	
comprehensive helicopter analysis system [AD-A063921] N	79-22082		N79-22119
Predesign of the second-generation comprehen		HYBRID STRUCTURES	
helicopter analysis system		Design, fabrication, and evaluation of GATO	
•	79-22083	(trade name) ceramic-wrought alloy attach	ment
Correlation study between vibrational		concepts for gas turbine engines	*70 22402
environmental and failure rates of civil		[AD-A064597] HYDRAULIC EQUIPMENT	N79-22102
helicopter components [NASA-CR-159033] N	79-23064	A research study into the reliability of va	rious
Helicopter transparent enclosures. Volume 2		fuel, hydraulic and air conditioning comp	
general specification		of military aircraft	
	79-23067		A79-33459
Helicopter transparent enclosures. Volume 1	:	Hydraulic compressor for a wind tunnel	N79-23107
Design handbook [AD-A065268] N	79-23068	The priming of a wind tunnel with a hydraul	
Evaluation of an energy distribution system		Compressor	
helicopter landing gears during hard landi			N79-23108
	79-23069	HYDRAZINES	
Helicopter fatigue evaluation. The UK appro		Hydrazine monopropellant reciprocating engi	ne
Patique life estimation methods for helicopt	79-23076	development	N79-22540
structural parts		HYDROCARBON COMBUSTION	117 22540
	79-23077	Formation of sooty particles in combustion	
Stabilized Terrain Optical Position Sensor (STOPS)	chambers with series injection of air int	o the
flight test report	70 02400	combustion zone	.70 20550
[AD-A065018] N	79-23100	HYDRODYNAMICS	A79-34550
Calculation and design of closed cycle heliu		Performance of a TAP-2 hydrofoll	
turbines for high temperature reactors	_		N79-23261
N	79-22098	HYDROPOILS	
HERMETIC SEALS		Performance of a TAP-2 hydrofoil	
Development of hermetically sealed low-maint			N79-23261
high-density packaging for ejection seat-m personnel parachutes	ounced	HYPERSONIC FLOW Hypersonic Viscous shock layer on infinite-	span
	79-33616	arrow wings at angle of attack	Dru.
HIGH ALTITUDE ENVIRONMENTS			A79-35158
Measurement of ozone in an aircraft		HYPERSONIC VEHICLES	1 -1
HIGH PREQUENCIES	79-34925	Optimization of hypersonic three-dimensiona	1 snapes 179-35584
Filtering technique based on high-frequency	plant		277 33304
modeling for high-gain control	•	i	
• • • • • • • • • • • • •	79-23097	•	
HIGH GAIN		ICE PORMATION	
Filtering technique based on high-frequency modeling for high-gain control	prant	<pre>Prost formation on an airfoil: A mathemati model 1</pre>	CgI
	79-23097		N79-22706
HIGH TEMPERATURE		IGNITION	
Fabrication of titanium at high temperatures		Ignition of fuel sprays by hot surfaces and	
	79-23252	stabilization of aircraft fires	N70- 02401
HIGH TEMPERATURE GAS COOLED REACTORS Calculation and design of closed cycle heliu	n	[AD-A065153] IGNITION TEMPERATURE	N79-23181
turbines for high temperature reactors		Preventing fires in airport fuel systems	
	79-22098		A79-34923
HIGH TEMPERATURE LUBRICANTS		IL-62 AIRCRAFT	
Design problems of small turbomachinery	70 22207	Technical characteristics and cost data for	
HISTORIES	79-22097	Il-62 and Il-62M aircraft and optimal fli	gnt
Milestones in the history of parachute devel	opment		A79-35475
		IMAGE PROCESSING	
HOMING DEVICES		System description: Aviation Wide-Angle Vi	
Experimental analysis of V.H.F. antennas for		System (AWAVS) Computer Image Generator (CIG)
helicopter homing systems using scale-mode techniques	1	visual system [AD-A065060]	N79-23683
	79-34392	IMPBLIERS	23003
HOT PRESSIEG		NC equipment spurs blisk manufacture - Full	
Heat treatment of P/M nickel-base superalloy	s for	production slated Numerical Control f	OL
turbine disks	70 22254	integrated helicopter compressor blade an	d disk
HOT SURPACES	79-23254	manufacture	A79-33589
Ignition of fuel sprays by hot surfaces and		IMPULSES	F19-33303
stabilization of aircraft fires		The electro-impulse de-icing method air	craft
[AD-A065153] N	79-23181	structures	
		[80-227]	N79-23073

SUBJECT INDEX JOINTS (JUNCTIONS)

INCIDENCE		ISOPERIHETRIC PROBLEM	_
Behavior of a transport aircraft with a laspect ratio wing at a high angle of in		Optimal excitation of amplitude-direction-find antennas Operating on the basis of the comparison method	ler
INERTIAL GUIDANCE	873 22003		9-35502
An efficient algorithm for computing the		ISOSTATIC PRESSURE	
Q-guidance matrix	N30 2203#	Heat treatment of P/M nickel-base superalloys	for
[AD-A064816] IMERTIAL PLATFORMS	N79-22074	turbine disks	9-23254
Error model verification for a three axis	s laser		,-43234
gyro strapdown inertial measurement un	ıt	. J	
[AD-A064047]	N79-22072		
INPIBITE SPAN WINGS Hypersonic Viscous shock layer on infinit	te-snan	JET AIRCRAFT The confluence of two supersonic jets at the	
arrow wings at angle of attack	te span	trailing edge of transonic turbine blades	
,	A79-35158		9-23426
INFLATABLE STRUCTURES		JET AIRCHAFT BOISE	
Development and initial test results of particle with Automatic Inflation Modulation /A		Relation between static and in-flight directivities of jet noise	
with adjusted initiation additions / a.	A79-33618		9-34585
Inflatable survival systems for helicopte	ers	Airport noise control and land use compatibili	
- 4 2 1 1 6 - 2 6 - 3 1 1	A79-33624	study	
Test and evaluation of modified high permoter arrorew life preserver	cormance	A comparison of costs associated with local	9-34972
[AD-A063959]	N79-22067	actions to reduce aircraft noise impacts	
INFRARED DETECTORS			9-34973
Bultichannel infrared receiver performance		Off-airport land use compatibility - The Mary	land
airborne detection of antiaircraft mis	811es A79-35210	approach and experience	9-34974
INFRARED RADIOMETERS	B79-33210	FAM proposes that the standard noise model be	
Detection of CAT and low altitude wind si	hear by	integrated noise model /INM/	
on-board aircraft IR sensors - An upda			9-34975
INJECTORS	A79-33630	A correlation of mixing noise from coannular j with inverted flow profiles	jets
The injector driven tunnel			9-22849
	N79-23106	Integrated noise model computerized simula	
IBLET PLON		of commercial jet aircraft noise near airpor	
Unsteady upstream effects in axial-flow s compressor stages	supersonic		9-22851
[ASME PAPER 79-GT-55]	A79-32350	The generation, radiation and prediction of supersonic jet noise. Volume 2, appendix:	
Experimental study on diffusers for mixed		Computer program listing	
machines			9-22854
[ASME PAPER 78-GT-120] Solution of boundary value problems for	A79-32936	Aerodynamic noise theory lighthill method,	
vibration equation for a jet engine mod		turbulent flow, sound pressure, and wave equ	9-23378
	A79-35895	Jet noise: A status report jet mixing and	
An experimental study of the response of		shock noise studies	
turbo-machine rotor to a low frequency distortion	iniet	JET REGIER FORLS	9-23379
[AD-A064776]	N79-23089	Preventing fires in airport fuel systems	
INLET HOZZLES		A75	9-34923
High angle of incidence implications upon		Thermodynamics of organic compounds	
intake design and location for supersor aircraft and highly maneuverable transc		[AD-A065664] N75	9-23232
aircraft		Research on the creep-rupture strength of	
	N79-22026	aluminized and nonaluminized jet-engine turi	bine
INSTRUMENT PLIGHT RULES	-	blades prepared from Nimonic 80A	0_22506
General aviation IPR operational problems [NASA-CR-159022]	N79-22068	Solution of boundary value problems for the	9-32586
INSTRUMENT LANDING SYSTEMS	22000	vibration equation for a jet engine model	
New technology S61N simulator		A79	9-35895
Evaluation of a remote tone signaling	A79-33458	Afterbody tests in the Modane hot gas bench	0-22005
control/monitor system as lightning/tra	nsient	[AAAF-NT-78-10] N79 JET PLON	9-23095
protection for solid state instrument		Peak Stroubal frequency of subsonic jet noise	as a
systems		function of Reynolds number	
[AD-A063766]	N79-22116		9-34537
INTAKE SYSTEMS Intake design and intake/airframe integra	ation for	Asymmetry of a circular jet observed in near a far fields low Re turbulence and acousti	
a post-stall fighter aircraft concept		characteristics	
	N79-22027		9-34539
Wind tunnel test at low speeds of a dorsa	al air	JET BIXING PLOW	
intake on a fighter configuration	N79-22029	A correlation of mixing noise from coannular just inverted flow profiles	jets
Wind-tunnel shock-tube simulation and eva			9-22849
of blast effects on an engine inlet		Jet noise: A status report jet mixing and	1
[AD-A065388]	ห79-23092	shock noise studies	
INTEGRAL EQUATIONS Three-dimensional lifting-surface theory	for an	JOINTS (JUNCTIONS)	9-23379
annular blade row		Operational experience with adhesive bonded	
[ASME PAPER 79-GT-182]	A79-32441	structures	
INTERPERORETERS	1+or		9-23450
Error analysis of a satellite interferone navigation system	ECEL	Behavior of adhesively bonded joints under cyc loading	211C
[NASA TASK 3]	A79-35097		9-23453
		The nature of adhesion mechanisms and the	
		<pre>influence of surface treatments on the behave of bonded joints</pre>	/10UI
			9-23455

KALBAN FILTERS SUBJECT INDEX

		LIFT DEAG RATIO	
K		Subcritical drag minimization for highly st	ept
KALHAN FILTERS		wings with leading edge vortices	N79-22021
Kalman filtering and smoothing in Potonap	for	Performance of a TAP-2 hydrofoil	877 22021
orbit determination using GPS measurement		[AD-A065102]	N79-23261
[AD-A064613]	N79-22071	LIPT PARS	
·		Low-speed wind-tunnel investigation of a	
İ		large-scale VTOL lift-fam transport mode	
		[NASA-TM-78560]	N79-22035
LAMINAR BOUNDARY LAYER Effects of turbulence on laminar separation		Three-dimensional lifting-surface theory for	ar an
aerodynamic surfaces such as airfoils and		annular blade row	or an
compressor blading	•	[ASME PAPER 79-GT-182]	A79-32441
	N79-22036	Lifting surface approach to the estimation	
LAND USE		response of finite wings	
Airport noise control and land use compatib	bility		A79-34596
study	.70 20050	Prediction of aerodynamic characteristics	
Off-timent land use semestability - The Mo	A79-34972	slender bodies alone and with lifting sur to high angles of attack	rraces
Off-airport land use compatibility - The Ma approach and experience	iryianu	to high angles of attack	N79-22023
affided and captibolic	A79-34974	LIGHT AIRCRAFT	
DOD's commendable initial efforts to solve		Dynamic identification of light aircraft	
use problems around airfields		structures and flutter certification	
	N79-22120	[ONERA, TP NO. 1979-31]	A79-32302
LANDING AIDS	+1120 22	Starting torque characteristics of small an	ICCTAIT
The measurement of RF-pulse phase and amplo the landing system DLS	ttude In	gas turbines and APU's [ASME PAPER 79-GT-95]	A79-32371
,	A79-34608	A review of small gas turbine combustion sy	
LANDING GEAR		development	
Designing aircraft shock absorbers		[ASME PAPER 79-GT-136]	A79-32405
	A79-32585	Light propeller aircraft noise	
Plight investigation of piloting techniques		1	A79-34980
crosswind limitations using a research ty crosswind landing gear	pe	A method for the optimal layout of driving mechanisms of the aileron for gliders and	
[NASA-TP-1423]	N79-23012	motorplanes	
Evaluation of an energy distribution system		motorpranot	A79-35921
helicopter landing gears during hard land		The fluid dynamic design of advanced centri	
[AD-A065298]	N79-23069	compressors	
LASER DOPPLER VELOCIMETERS			N79-22508
Preliminary studies using photon correlation		LIGHTHILL METHOD	
velocimetry'in turbomachinery and combust systems	tion	<pre>Aerodynamic noise theory lighthill met! turbulent flow, sound pressure, and wave</pre>	
	A79-34314		N79-23378
LASER DRILLING		LIGHTNING	
Laser balancing demonstration on a high-spe	ed	Lightning transient research on an F-111F a	nrcraft
flexible rotor		[AD-A063765]	N79-22066
	A79-32351	Evaluation of a remote tone signaling	
LEADING EDGE SLATS	c+	control/monitor system as lightning/trans	
Development of a viscous vortex/wing intera program for thick wings with bounded lead		protection for solid state instrument lar systems	lulig
[AD-A065181]	N79-23020	[AD-A063766]	N79-22116
LEADING EDGES		LIBEARIZATION	
Investigation of the regimes of flow past t		Relationships for nozzle performance coeffi	
upper surfaces of delta wings with shock	waves	[ASME PAPER 79-GT-145]	A79-32411
separated from the leading edges	A79-35110	LININGS User guide for STRMIN: A houndary-layer no	-Adram
Strake-induced separation from the leading		User guide for STRMLN: A boundary-layer pr for contoured wind-tunnel liner design	.ogram
of wings of moderate sweep		[NASA-CR-159058]	N79-23114
	N79-22002	LIQUID COOLING	
On slender wings with leading edge camber		Aerodynamic problems in cooled turbine black	ing
An one-montal amost	N79-22032	design for small gas turbine	W70-2222
An experimental investigation of the entra- of a leading-edge vortex	rumeur	LOAD DISTRIBUTION (FORCES)	N79-22091
or a reduting-ende sotrer	N79-22033	Patique of helicopters: Service life evalu	ation
LECTURES		method	
STOL Technology, volume 2			N79-23079
[VKI-LECTURE-SERIES-60-VOL-2]	N79-23002	LOADS (FORCES)	
LIPE CICLE COSTS		CH-47 helicopter internal cargo load and re	straint
An appraisal of models used in life cycle of	cost	system mock-up study	N70-22001
estimation for USAF aircraft systems [AD-A064333]	N79-22964	[AD-A064207] LOSSES	N79-22081
Systems approach to life-cycle design of	1175-22304	Performance estimation of partial admission	torbines
pavements. Volume 3: LIFE2 program list	ting	[ASME PAPER 79-GT-123]	A79-32392
[AD-A064698]	N79-23260	Low-turbulence high-speed wind tunnel for t	he
LIPE RAPTS		determination of cascade shock losses	
Inflatable survival systems for helicopters		[ASME PAPER 79-GT-129]	A79-32398
1 Tem	A79-33624	LOW ALTITODE	er hu
The aerodynamics and performance characteri	stice	Detection of CAT and low altitude wind shea	ir by
The aerodynamics and performance characters of direct lift schemes	LOCICO	on-board aircraft IR sensors - An update	A79-33630
475444 777460	N79-23004	LOW ASPECT RATIO	
LIFT AUGMENTATION		An application of 3-D viscous flow analysis	to the
Engine integration and noise considerations	for	design of a low-aspect-ratio turbine	
STOL alrcraft		[ASME PAPER 79-GT-53]	A79-32348
larodunance and nonformer at the state of	N79-23005	Aerodynamics of low aspect ratio wings	N70-22052
Aerodynamics and performance characteristic Wing lift augmentation schemes	.s UI		N79-23053
	N79-23006		

SUBJECT INDEX HILITARY AIRCRAFT

Study of blade aspect ratio on a compresso stage aerodynamic and mechanical design		Computer formulations of aircraft models for simulation studies	or
[NASA-CR-159555] LOW COST	พ79-23085	[NASA-TP-1470] BATRICES (BATHEMATICS)	N79-23008
A low cost, on-site performance monitoring	system	An efficient algorithm for computing the	
thermodynamics of shaft power gas tu [ASME PAPER 79-GT-21]	rbines A79-32334	Q=guidance matrix [AD-A064816]	N79-22074
LOW PASS FILTERS Piltering technique based on high-frequenc	w nlan+	MAXIBUE LIEBLIHOOD ESTIMATES Important factors in the maximum likelihood	a
modeling for high-gain control		analysis of flight test maneuvers	
[NASA-CASE-LAR-12215-1] LOW SPEED	N79-23097	[NASA-TP-1459] BECHABICAL DRIVES	N79-22113
An investigation into the pressure distrib		A method for the optimal layout of driving mechanisms of the aileron for gliders an	a
over a wing and store combination at low [BU-226]	N79-23047	motorplanes	
LOW SPEED WIND TUNNELS Wind tunnel test at low speeds of a dorsal	aır	BECHABICAL PROPERTIES	179-35921
intake on a fighter configuration	N79-22029	Analysis of the mechanical properties of reforms with particular consideration of a	
Low-speed wind-tunnel parametric investiga	tion of	polyether structural foam	
flight spoilers as trailing-vortex-allev devices on a transport aircraft model	lation	[BU-229] Behavior of adhesively bonded joints under	N79-23227 cyclic
[NASA-TP-1419] Review of large low speed wind tunnel regu	N79-22038	loading	N79-23453
for STOL testing		The nature of adhesion mechanisms and the	
Modernization of the low speed wind tunnel	N79-22999 at	influence of surface treatments on the boof bonded joints	ehaviour
Breguet de Velizy: Measuring system mode		METAL SHEETS	N79-23455
[AA AP-NT-78-12]	N79-23122	Gust spectrum fatigue crack propagation in	
LOW TURBULBUCE Low-turbulence high-speed wind tunnel for	the	candidate skin materials	A79-33201
determination of cascade shock losses [ASME PAPER 79-GT-129]	A79-32398	<pre>HETAL-HETAL BONDING Ultrasonic bonding arrives - 75% cost savi:</pre>	nas seen
LUBRICATION		-	A79-33586
User's manual for steady state and transies thermal analysis of a shaft-bearing system.		Behavior of adhesively bonded joints under loading	cyclic
(SHABERTH) [AD-A064150]	N79-22523	BETEOROLOGI	N79-23453
		European scientific notes, volume 32, number [AD-A065400]	er 5 N79-23885
M		HICROPROCESSORS	
MACH NUMBER A special extension of the General Point		Practical 'on-engine' microprocessor contromonitoring systems for gas turbines	
Performance Equation for flight path	s A79-35926	[ASME PAPER 79-GT-181] MICROSTRUCTURE	A79-32440
MACHINING Laser balancing demonstration on a high-sp	ned.	Heat treatment of P/B nickel-base superalle turbine disks	oys for
flexible rotor			N79-23254
[ASME PAPER 79-GI-56] HAGHETIC PERHEABILITY	A79-32351	BICROWAVE EQUIPMENT An experimental passive microwave attitude	
Lightning transient research on an P-111E [AD-A063765]	aircraft N79-22066	measurement system for escape system ste	ering A79-33637
MAN MACHINE SYSTEMS Semiautomatic control of aircraft: Systems		MICROWAVE LANDING SYSTEMS Advanced application of the MADGE approach	
manual aircraft control Russian book		offshore	
MANUAL CONTROL	A79-34504	BIDAIR COLLISIONS	A79-33457
Semiautomatic control of aircraft: Systems manual aircraft control Russian book		Beacon-based collision avoidance system - Experimental results	
	A79-34504	<u>-</u>	A79-33606
MANUFACTURING Similitude, manufacturing, identification,		Factors in evaluating the effectiveness of collision avoidance logic	
<pre>instrumentation of test models aircr [AAAF-NT-78-24]</pre>	aft models N79-23120	BILITARY AIR PACILITIES	A79-33607
MARKET RESEARCH Demand for large freighter aircraft as pro		DOD's commendable initial efforts to solve use problems around airfields	land
by the NASA cargo/logistics airlift syst		[PB-291617/9]	N79-22120
studies [AIAA 79-0842]	A79-33829	BILITARY AIRCRAFT A research study into the reliability of v	arıous
MARYLAND Off-airport land use compatibility - The N	arvland	fuel, bydraulic and air conditioning com of military aircraft	ponents
approach and experience	A79-34974		A79-33459
MATHEMATICAL MODELS		Study of installed environment of various equipments in military aircraft	
In-flight captive store loads compared wit wind-tunnel and mathematical simulations		Alrcrew experiences in USAP ejections, 197	A79-33460 1-1977
The impact of changing technology on the de	A79-34595	Analyzing technology potential for strateg	A79-33609
for air transportation		[AIAA 79-0841]	A79-33828
[NASA-CR-152191] Application of model algorithmic control to	₩79-22065 o a	Large wing-in-ground effect transport airc [AIAA 79-0845]	A79-33830
lightly damped single input single outpu [AD-A064222]		Charter 1-ft waltala	
	N79-22115	Strategic airlift wehicle concepts [AIAA 79-0850]	A79-33833
Integrated noise model computerized si	N79-22115 Dulation	[AIAA 79-0850] Advanced nuclear systems for large aircraf	t
Integrated noise model computerized si of commercial jet aircraft noise near ai	N79-22115 Dulation	[AIAA 79-0850]	

BILITARY HELICOPTERS SUBJECT INDEX

Some UK research studies of the use of win strakes on combat aircraft configuration high angles of attack	s at	MORTABS (MATERIAL) The electro-impulse de-icing method all structures	
Development of a NICAD battery interface u	N79-21999 nit 	[BU-227] MULTIPHASE PLOW	N79-23073
for use on Army aircraft [AD-A064290]	N79-22637	Experimental study on diffusers for mixed- machines	flow
An appraisal of models used in life cycle estimation for USAF aircraft systems	cost	[ASME PAPER 78-GT-120]	A79-32936
[AD-A064333] MILITARY HELICOPTERS	N79-22964	N	
Copter windshields made tougher - Special o	coating	HASA PROGRAMS	
extends life, adds safety Death by misadventure helicopter escap.	A79-33588 e system	Demand for large freighter aircraft as pro by the NASA cargo/logistics airlift syst. studies	
proposals Engineer design test 1, Hughes YAH-64, adv	A79-33640	[ATAM 79-0842] Important factors in the maximum likelihoo analysis of flight test maneuvers	A79-33829 d
attack helicopter		[NASA-TP-1459]	N79-22113
[AD-A064359] HILITARY SPACECRAFT	N79-22077	Ames Research Center publications, 1977 [NASA-TM-78514]	N79-22957
Navigation by satellites	A79-32582	NATIONAL AVIATION SYSTEM National airport system plan 1978 - 1987	
MINICOMPUTERS Modernization of the low speed wind tunnel	at	NAVIER-STORES EQUATION	N79-23060
Breguet de Velizy: Measuring system moder	rnization	Visualisations and calculations of air inta high angles of attack and low Reynolds n	
[AAAF-NT-78-12] HISSILE COMPONENTS	N79-23122	Navier-Stokes equation	N79-22030
Aerodynamics of low aspect ratio wings	N79-23053	NAVIGATION AIDS User's guide to data preparation: Photogra	ammetric
MISSILE CONFIGURATIONS Bumblebee Program: Aerodynamic data. Par		navigation analysis program Fotonap	N79-22070
Wing loads at Mach numbers 1.5 and 2.0 missile configurations		NAVIGATION SATELLITES Navigation by satellites	A75 22070
[NASA-CR-3117] HISSILE DESIGE	N79-22041	Error analysis of a satellite interferomete	179-32582
A brief review of air flight weapons	N79-23051	navigation system [NASA TASK 3]	A79-35097
Aerodynamics of low aspect ratio wings	N79-23053	NICKEL ALLOYS Heat treatment of P/M nickel-base superalle	oys for
MISSILE DETECTION Multichannel infrared receiver performance	for	turbine disks	N79-23254
airborne detection of antiaircraft missi		NICKEL CADMIDE BATTERIES Development of a NICAD battery interface un	
HISSILES	879-33210	for use on Army alrcraft	
<pre>High angle of attack aerodynamics [AGARD-CP-247]</pre>	N79-21996	[AD-A064290] NIHONIC ALLOYS	N79-22637
A brief review of air flight weapons	N79-23051	Research on the creep-rupture strength of aluminized and nonaluminized jet-engine	turbine
MODAL RESPONSE Forced vibrations of a single stage axial		blades prepared from Nimonic 80A	A79-32586
compressor rotor	N70 22202	HOISE GENERATORS	•
[ASME PAPER 79-GT-108] Modal analysis of gas turbine buckets using	A79-32383 g a	The generation, radiation and prediction of supersonic jet noise. Volume 2, appendix	
digital test system [ASME PAPEE 79-GT-124]	A79-32393	Computer program listing [AD-A064685]	N79-22854
MODERS Standard Avionics Modules (SAM) for existing	na modems	NOISE INTENSITY Integrated noise model computerized si	mulation
[AD-A065629]	N79-23083	of commercial jet aircraft noise near air	rports
MODULES Assessment of augmented electronic fuel con		NOISE BEASUREMENT	N79-22851
for modular engine diagnostics and condi- monitoring	tion	Light propeller aircraft noise	A79-34980
[AD-A065128] HOMENTUM THEORY	N79-23091	NOISE POLLUTION Traffic background level and signal duration	on
Rotary-wing aerodynamics. Volume 1: Basic		effects on aircraft noise judgment	
theories of rotor aerodynamics with appli- to helicopters momentum, vortices, al potential theory	nd	Airport noise control and land use compati	A79-34580 bility
[NASA-CR-3082] ************************************	N79-22039	•	A79-34972
Evaluation of a remote tone signaling Control/monitor system as lightning/trans	sient	PAA proposes that the standard noise model integrated noise model /INM/	A79-34975
protection for solid state instrument landsystems	nding	DOD's commendable initial efforts to solve use problems around airfields	land
[AD-A063766] Digital data acquisition system for use in	N79-22116	[PB-291617/9] NOISE PROPAGATION	N79-22120
aircraft engine condition monitoring [ARL-MECH-ENG-REPT-151] MONOPROPELLANTS	N79-23088	The derivation of a thickness noise formula the far-field by Isom applied to hele rotors	
Hydrazine monopropellant reciprocating eng	ıne		A79-35449
development	N79-22540	NOISE REDUCTION Quieter short and medium haul aircraft	
MONOPULSE ANTENNAS Optimal excitation of amplitude-direction- antennas operating on the basis of the	finder	A comparison of costs associated with loca actions to reduce aircraft noise impacts	A79-34921 1
Comparison method	A79-35502		A79-34973

SUBJECT INDEX PARACHUTE PABRICS

Jet noise: A status report jet mixin shock noise studies	ng and	Environmental effects on VLP navigation sys	stems,
Shook house studies	N79-23379	[AD-A063882]	N79-22073
NOISE TOLERANCE Physical and subjective studies of aircra		Omega possibilities: Limitations, options, opportunities	, and
interior noise and vibration	12.0	[AD-A065027]	N79-23063
[NA SA-TM-80084]	N79-23754	OPERATIONAL PROPLEES	
HOSE CONES		General aviation IPR operational problems	
Prediction of lateral aerodynamic loads of aircraft at high angles of attack	מס	[NASA-CR-159022] STOL Technology, volume 2	N79-22068
arrorare at argu angres or accaex	N79-22024	[VKI-LECTURE-SERIES-60-VOL-2]	N79-23002
NOSE PINS		OPTICAL BEASUREBENT	
Some OK research studies of the use of wi		Influence of gridboard line width and space	ing on
strakes on combat aircraft configuration high angles of attack	ons at	windscreen distortion measurements [AD-A065821]	N79-23070
migh angles of accack	N79-21999	Optical flow measurements: Applications to	
Design guidelines for the application of		tunnels or motor bench tests	
and nose strakes to a fighter aircraft	tased on		N79-23117
F-16_wind tunnel testing experiment	N79-22000	OPTICAL MEASURING INSTRUMENTS Stabilized Terrain Optical Position Sensor	/STARS)
Strake-induced separation from the leading		flight test report	(31023)
of wings of moderate sweep	.,,		N79-23100
	N79~22002	OPTICAL TRACKING	_
Bolationships for neggle perference goof	. francosta	Parametric analysis of stereometric tracker	for
Relationships for nozzle performance coef [ASME PAPER 79-GT-145]	A79-32411	use in tactical aircraft [AD-A064688]	N79-22086
BOZZLE PLON	E/3 32 / / /	OPTIMAL CONTROL	, 22000
Relationships for nozzle performance coef		Radio-engineering tracking systems	
[ASME PAPER 79-GT-145]	A79-32411	ADMITTO STATE	A79-35501
NOZZLE THRUST COEFFICIENTS Relationships for nozzle performance coef	ficients	OPTIBIZATION Optimal excitation of amplitude-direction-i	inder.
[ASME PAPER 79-GT-145]	A79-32411	antennas operating on the basis of the	
Characteristics of Laval nozzles with gas	sdynamıc	comparison method	
regulation	A79-34650	Out	A79-35502
NUCLEAR PROPULSION	A /9-34030	Optimization of hypersonic three-dimensions	A79-35584
Nuclear Bi-Brayton system for aircraft pr	opulsion	Optimization of wing structures to satisfy	55550
[ASME PAPER 79-GT-119]	A79-32389	strength and frequency requirements	
Advanced nuclear systems for large aircra		013 Pareter and another attended 6-	A79-35717
[AIAA 79-0852] HUMERICAL ABALYSIS	A79-33835	Closed Brayton cycle system optimization fo undersea, terrestrial, and space applicat	
Numerical representation of aircraft geom	etry	andersedy terreservaty and space approach	N79-22096
	A79-32588	Adaptation for the economy or adaptation for	
Numerical analysis of flow through turbin	ie	energy conservation passenger aircraf	t design N79-23537
cascades by the Modified FLIC Method	A79-32590	[AAAF-NT-77-23] ORBIT CALCULATION	M/9-2333/
A numerical solution of supersonic and hy		Kalman filtering and smoothing in Potonap f	or
viscous flow fields around thin planar		orbit determination using GPS measurement	
		[AD-A064613]	N79-22071
[AD-A065632]	N79-23028		22011
NUMBRICAL CONTROL		ORGANIC COMPOUNDS	.,, 220,1
	speed	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664]	N79-23232
NUMBRICAL CONTROL Laser balancing demonstration on a high-s flexible rctor [ASME PAPER 79-GI-56]	speed A79-32351	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A055664] ORTHOTROPIC PLATES	N79-23232
NUMERICAL CONTROL Laser balancing demonstration on a high-s flexible rctor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont	speed A79-32351	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability	N79-23232
NOMERICAL CONTROL Laser balancing demonstration on a high-s flexible rctor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont monitoring systems for gas turbines	a79-32351 crol and	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A055664] ORTHOTROPIC PLATES	N79-23232 of
NUMERICAL CONTROL Laser balancing demonstration on a high-s flexible rctor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont	a79-32351 crol and a79-32440	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability	N79-23232
NUMERICAL CORTROI Laser balancing demonstration on a high-siderible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont monitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fur production slated Numerical Control	apeed A79-32351 crol and A79-32440 all-scale	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLON Unsteady effects on a stalled wing in pulse	N79-23232 of A79-33461 ed flow
NUMERICAL CORTROI Laser balancing demonstration on a high-siflexible retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor continuonitoring systems for gas turbines [ASME PAPER 79-GI-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade	apeed A79-32351 crol and A79-32440 all-scale	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW	N79-23232 of A79-33461 ed flow ling case
NUMERICAL CORTROI Laser balancing demonstration on a high-s flexible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont monitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fu production slated Numerical Control	A79-32351 crol and A79-32440 all-scale for and disk	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLON Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat	N79-23232 of A79-33461 od flow ing case A79-32288
RUMERICAL CORTROL Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor continuonitoring systems for gas turbines [ASME PAPER 79-GI-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture	apeed A79-32351 crol and A79-32440 all-scale	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLON Unsteady effects on a stalled wing in pulse	N79-23232 of A79-33461 ad flow lng case A79-32288 s in a
NUMERICAL CORTROI Laser balancing demonstration on a high-siflexible retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor continuonitoring systems for gas turbines [ASME PAPER 79-GI-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade	A79-32351 crol and A79-32440 all-scale for and disk	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel	N79-23232 of A79-33461 od flow ing case A79-32288
NUMERICAL CORTROI Laser balancing demonstration on a high-siflexible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor cont monitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Furbroduction slated Numerical Control integrated helicopter compressor blade manufacture	A79-32351 crol and A79-32440 all-scale for and disk	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLON Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel	N79-23232 of A79-33461 ad flow lng case A79-32288 s in a
RUMERICAL CORTROL Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor continuonitoring systems for gas turbines [ASME PAPER 79-GI-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel	N79-23232 of A79-33461 ad flow lng case A79-32288 s in a
RUMERICAL CORTROI Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OPPSHORE PLATFORMS	A79-32351 crol and A79-32440 all-scale for and disk A79-33589	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A055664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290
Laser balancing demonstration on a high-single retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OPFSHORE PLATFORMS Advanced application of the MADGE approact offshore	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A065664] ORTHOTROFIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLON Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290
Laser balancing demonstration on a high-single retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture O OPPSHORE PLATFORMS Advanced application of the MADGE approact offshore OB-58 RELICOPTER	A79-32351 crol and A79-32440 all-scale for and disk A79-33589	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A055664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290
Laser balancing demonstration on a high-sinite retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GI-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OPFSHORE PLATFORMS Advanced application of the MADGE approact offshore OB-58 RELICOPTER Preliminary design study of a composite me blade for the OB-58 helicopter. Volume	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch aid A79-33457	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRI Beasurement of ozone in an aircraft	N79-23232 of A79-33461 ed flow ling case A79-32288 s in A79-32290
Laser balancing demonstration on a high-single retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite me blade for the OH-58 helicopter. Volume Trade analysis and preliminary designs	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch aid A79-33457	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat-	N79-23232 of A79-33461 ed flow eng case A79-32288 s in a A79-32290 A79-34925
Laser balancing demonstration on a high-siterible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor continuous systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 BELICOPTER Preliminary design study of a composite me blade for the OH-58 helicopter. Volume Trade analysis and preliminary design s composite OH-58 main rotor blade	A79-32351 crol and A79-32440 all-scale for and disk A79-33589 ch aid A79-33457 taln rotor cttudy of	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-MO5664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DEMSITY Development of hermetically sealed low-main	N79-23232 of A79-33461 ed flow ing case A79-32288 s in a A79-32290 A79-34925
RUMERICAL CORTROI Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Furoduction slated Numerical Control integrated helicopter compressor blade manufacture O OPPSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 RELICOPTER Preliminary design study of a composite methode for the OH-58 helicopter. Volume Trade analysis and preliminary design scomposite OH-58 main rotor blade [AD-AO64459]	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch and A79-33457 claim rotor clitudy of W79-22080	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-MO5664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DEMSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes	N79-23232 of A79-33461 ed flow eng case A79-32288 s in a A79-32290 A79-34925
Laser balancing demonstration on a high-siterible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor continuous systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 BELICOPTER Preliminary design study of a composite me blade for the OH-58 helicopter. Volume Trade analysis and preliminary design s composite OH-58 main rotor blade	A79-32351 Frol and A79-32440 A11-scale For and disk A79-33589 The haid A79-33457 Front Fr	OBGANIC COMPOUNDS Thermodynamics of organic compounds [AD-MO5664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRI Measurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PAMEL PLUTTER Time-variant aerodynamics of oscillating an	N79-23232 of A79-33461 od flow ing case A79-32288 is in a A79-32290 A79-34925 atenance mounted A79-33616
RUMERICAL CORTROI Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Furoduction slated Numerical Control integrated helicopter compressor blade manufacture O OPPSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 RELICOPTER Preliminary design study of a composite methode for the OH-58 helicopter. Volume Trade analysis and preliminary design scomposite OH-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades prelimination [AD-A065010]	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch and A79-33457 clain rotor clitudy of N79-22080 nary	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER	N79-23232 of A79-33461 ed flow ring case A79-32288 s in a A79-32290 A79-34925 etenance mounted A79-33616 erfoil
Laser balancing demonstration on a high-sinite retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture OPFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 RELICOPTER Preliminary design study of a composite methade for the OH-58 helicopter. Volume Trade analysis and preliminary design secomposite OH-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades prelimitesign investigation [AD-A065010] Plight evaluation MK 2 integrated control	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch and A79-33457 clain rotor clitudy of N79-22080 nary	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating an surfaces in a supersonic flowfield	N79-23232 of A79-33461 od flow ing case A79-32288 is in a A79-32290 A79-34925 atenance mounted A79-33616
RUMERICAL CORTROI Laser balancing demonstration on a high-sifierible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor continuous systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite musure blade for the OH-58 helicopter. Volume Trade analysis and preliminary design s composite OH-58 main rotor blade [AD-AO64159] OH-58 composite main rotor blades prelimin design investigation [AD-A065010] Plight evaluation MK 2 integrated control installed in an OH-588 helicopter	A79-32351 crol and A79-32440 cll-scale for and disk A79-33589 ch and A79-33457 clain rotor clitudy of N79-22080 nary	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-MO5664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillate Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRI Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating an surfaces in a supersonic flowfield PARACHUTE FABRICS	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290 A79-34925 etenance mounted A79-33616 erfoil A79-34531
Laser balancing demonstration on a high-sinite retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture OPFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 RELICOPTER Preliminary design study of a composite methade for the OH-58 helicopter. Volume Trade analysis and preliminary design secomposite OH-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades prelimitesign investigation [AD-A065010] Plight evaluation MK 2 integrated control	A79-32351 crol and A79-32440 all-scale cfor and disk A79-33589 ch aid A79-33457 cain rotor cttly of N79-22080 nary N79-22085 ler	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield PARACHUTE FABRICS Development of hermetically sealed low-main high-density packaging for ejection seat-	N79-23232 of A79-33461 ed flow ring case A79-32288 s in a A79-32290 A79-34925 etenance mounted A79-33616 erfoil A79-34531
Laser balancing demonstration on a high-siterible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite method blade for the OH-58 helicopter. Volume Trade analysis and preliminary design stomposite OH-58 main rotor blade [AD-AO64159] OH-58 composite main rotor blades preliminated in investigation [AD-AO65010] Plight evaluation MK 2 integrated control installed in an OH-58A helicopter [AD-AO65072] OLLS Out squeeze film dampers for reducing vib	A79-32351 crol and A79-32440 cll1-scale for and disk A79-33589 ch aid A79-33457 cll rotor cll: ctudy of N79-22080 cnary N79-22085 ler N79-23103	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-MO5664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Measurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL FLUTTER Time-variant aerodynamics of oscillating as surfaces in a supersonic flowfield PARACHUTE PABRICS Development of hermetically sealed low-main	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290 A79-34925 denounted A79-33616 erfoil A79-34531 denauce mounted
Laser balancing demonstration on a high-siflexible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OPPSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite mublade for the OH-58 helicopter. Volume Trade analysis and preliminary design study composite off-58 composite off-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades preliminary design investigation [AD-A065010] Plight evaluation MK 2 integrated control installed in an OH-58A helicopter [AD-A065072] OILS Oil squeeze film dampers for reducing vibaircraft gas turbine engines	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589 ch aid A79-33457 dain rotor ctudy of N79-22080 nary N79-22085 ler N79-23103 cration of	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Measurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL FLUTTER Time-variant aerodynamics of oscillating as surfaces in a supersonic flowfield PARACHUTE PABRICS Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes	N79-23232 of A79-33461 ed flow ling case A79-32288 s in a A79-32290 A79-34925 etenance mounted A79-33616 effoil A79-34531 etenance mounted A79-33656
Laser balancing demonstration on a high-siterible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Fuproduction slated Numerical Control integrated helicopter compressor blade manufacture O OFFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite method blade for the OH-58 helicopter. Volume Trade analysis and preliminary design stomposite OH-58 main rotor blade [AD-AO64159] OH-58 composite main rotor blades preliminated in investigation [AD-AO65010] Plight evaluation MK 2 integrated control installed in an OH-58A helicopter [AD-AO65072] OLLS Out squeeze film dampers for reducing vib	A79-32351 crol and A79-32440 cll1-scale for and disk A79-33589 ch aid A79-33457 cll rotor cll: ctudy of N79-22080 cnary N79-22085 ler N79-23103	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING FLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft P PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield PARACHUTE FABRICS Development of hermetically sealed low-main high-density packaging for ejection seat-	N79-23232 of A79-33461 ed flow ling case A79-32288 s in a A79-32290 A79-34925 etenance mounted A79-33616 effoil A79-34531 etenance mounted A79-33656
Laser balancing demonstration on a high-siflerible retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Furoduction slated Numerical Control integrated helicopter compressor blade manufacture OPFSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 RELICOPTER Preliminary design study of a composite mulade for the OH-58 helicopter. Volume Trade analysis and preliminary design secomposite OH-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades preliminated in the present of the place of the	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589 ch aid A79-33457 dain rotor ctudy of N79-22080 nary N79-22085 ler N79-23103 cration of A79-32402	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield PARACHUTE PABRICS Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes On the status of experimental stress analys	N79-23232 of A79-33461 ed flow ling case A79-32288 s in a A79-32290 A79-34925 etenance mounted A79-33616 effoil A79-34531 etenance mounted A79-33656
Laser balancing demonstration on a high-sinite retor [ASME PAPER 79-GI-56] Practical 'on-engine' microprocessor contmonitoring systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Furoduction slated Numerical Control integrated helicopter compressor blade manufacture OPFSHORE PLATFORMS Advanced application of the MADGE approace offshore OH-58 RELICOPTER Preliminary design study of a composite metable for the OH-58 helicopter. Volume Trade analysis and preliminary design secomposite OH-58 main rotor blade [AD-A064159] OH-58 composite main rotor blades preliminated design investigation [AD-A065010] Plight evaluation MK 2 integrated control installed in an OH-58A helicopter [AD-A065072] OILS Oil squeeze film dampers for reducing vibaircraft gas turbine engines [ASME PAPER 79-GT-133] OMEGA MAVIGATION SYSTEM Omega - Global navigating by VLF fix	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589 ch aid A79-33457 dain rotor ctudy of N79-22080 nary N79-22085 ler N79-23103 cration of	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield PARACHUTE PABRICS Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes On the status of experimental stress analys	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290 A79-34925 etenance mounted A79-33616 erfoil A79-34531 etenance mounted A79-33616 erfoil A79-33616 erfoil A79-33616
Laser balancing demonstration on a high-siterible retor [ASME PAPER 79-GT-56] Practical 'on-engine' microprocessor continuous systems for gas turbines [ASME PAPER 79-GT-181] NC equipment spurs blisk manufacture - Further production slated Numerical Control integrated helicopter compressor blade manufacture OPPSHORE PLATFORMS Advanced application of the MADGE approact offshore OH-58 HELICOPTER Preliminary design study of a composite mulade for the OH-58 helicopter. Volume Trade analysis and preliminary design stomposite OH-58 main rotor blade [AD-AO64159] OH-58 composite main rotor blades prelimin design investigation [AD-AO65010] Plight evaluation MK 2 integrated control installed in an OH-58A helicopter [AD-AO65072] OILS Oil squeeze film dampers for reducing vibaircraft gas turbine engines [ASME PAPER 79-GT-133] OHEGA MAVIGATION SYSTEM	A79-32351 crol and A79-32440 ill-scale for and disk A79-33589 ch aid A79-33457 dain rotor ctudy of N79-22080 nary N79-22085 ler N79-23103 cration of A79-32402	ORGANIC COMPOUNDS Thermodynamics of organic compounds [AD-A05664] ORTHOTROPIC PLATES Some observations on the local instability orthotropic structural sections OSCILLATING PLOW Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel OZONOMETRY Beasurement of ozone in an aircraft PACKING DENSITY Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes PANEL PLUTTER Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield PARACHUTE PABRICS Development of hermetically sealed low-main high-density packaging for ejection seat- personnel parachutes On the status of experimental stress analys	N79-23232 of A79-33461 ed flow ing case A79-32288 is in a A79-32290 A79-34925 etenance mounted A79-33616 erfoil A79-34531 etenance mounted A79-33616 erfoil A79-33616 erfoil A79-33616

PARACHUTES SUBJECT INDEX

DIDICUTATO		DTIOM DDDDADMARAU	
PARACHUTES Development and initial test results of para with Automatic Inflation Modulation /A.I.M.	./	PILOT PERFORMANCE A flyable suspended model helicopter for the investigation of the human pilot behaviour	
Basis for an objective evaluation of the par jumping reliability		Flight investigation of piloting techniques crosswind limitations using a research typ	
Milestones in the history of parachute devel	79-33619 opment 79-33620	crosswind landing gear [NASA-TP-1423] N Flight evaluation BK 2 integrated controller	79-23012
PASSENGER AIBCRAFT	79-33020	installed in an OH-58A helicopter	
Britain's better airbus wing A-310 aircr wing design	aft	[AD-A065072] N PILOT TRAIBING	79-23103
A Pour jets for short-haul work BAe 146	79-34823	New technology S61N simulator	79-33458
An analysis of long and medium-haul air pass	79-34922 enger	Advanced Simulator for Pilot Training (ASPT) Aerial refueling visual simulation-engineer	: ring
demand, volume 1 [NASA-CR-152156] An analysıs of short haul air passenger dema	79-22062	[AD-A063283] N' PILOTLESS AIRCRAPT RPV electric power system study. Phase 2:	79-22118
volume 2		bench mockup development	
[NASA-CR-152157] N Adaptation for the economy or adaptation for	79-22063	[AD-A065008] N'	79-22110
energy conservation passenger aircraft	design 79-23537	Effect of friction on motion of a piston dri- combustion products	ven by
PASSENGERS			79-35656
Physical and subjective studies of aircraft interior noise and vibration		PISTONS Centrifugal-reciprocating compressor	
	79-23754		79-23431
Vortex pattern developing on the upper surfar a swept wing at high angle of attack	ce of	Effect of interblade phase angle and incident angle on cascade pitching stability	ce
n ,	79-22007	[ASHE PAPER 79-GT-153] A	79-32418
PAYEBERTS Systems approach to life-cycle design of		Normal force and pitching moment of wing-bod combinations in the nonlinear angle-of-att	
pavements. Volume 3: LIPE2 program listi		range at subsonic speeds	
[AD-A064698] N PERFORMANCE PREDICTION	79-23260	N The influence of sweep on the aerodynamic loa	79-22022 adang
Performance estimation of partial admission		of an oscillating NACA 0012 airfoil. Volum	
[ASME PAPER 79-GT-123] Relationships for nozzle performance coeffic	79-32392	Technical report [NASA-CR-3092] N	79-22052
[ASME PAPER 79-GT-145] A	79-32411	PLASTIC AIRCRAFT STRUCTURES	.,
A study of the Sheriff's wing [BU-215] N	79-23072	Economical processing of fiber-reinforced components with thermal expansion molding	
PERFORMANCE TESTS		CFRP structures for aircraft aileron	
Design and testing of two supercritical compacts cascades	ressor	[DGLR PAPER 79-011] A'PLUMES	79-32307
[ASME PAPER 79-GT-11] A	79-32330	Wind tunnel model study of the hot exhaust p	lume
Shock boundary layer interaction on high turn transonic turbine cascades	ning 79-32342	from the compressor research facility at Wright-Patterson Air Force Base, Ohio [ASME PAPER 79-GT-186] A.	79-32445
An overview of the U.S. Navy Maximum Perform		PHRUMATIC CONTROL	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Ejection System	79-33613	Advanced flight control actuation system (APCAS-E/P): Feasibility investigation of	an
Development and initial test results of para-	chutes	electro/pneumatic dual power driven concept	t
with Automatic Inflation Modulation /A.I.M.	•/ 79-33618	[AD-A063992] N'POINT SOURCES	79-22114
U.S. Navy developments in crashworthy seating		Correlation-extremal direction finding of exand point sources of electromagnetic oscil.	
Development and testing of a dual mode escape		y .	79-35506
propulsion system	79-33635	POLAR REGIONS Air France's Paris-Tokyo transpolar flight 1	n 1978
A new high product rate 10 nanosecond, 256 pe	oint	A*	79-32583
correlator for weapon system application and fluid mechanics research	ons	POLLUTION CONTROL A review of small gas turbine combustion systems	ten
À.	79-34305	development	
PERTURBATION TERORY A general solution for distorted flows in ca	scades	Airport noise control and land use compatibil	79-324 0 5 lity
of aerofoils [ASME PAPER 79-GT-65] A	79-32353	study A	79-34972
PHASE SHIFT		A comparison of costs associated with local	
Effect of interblade phase angle and incident angle on cascade pitching stability	ce	actions to reduce aircraft noise impacts A	79-34973
[ASME PAPER 79-GT-153] APPHASED ARRAYS	79-32418	Off-airport land use compatibility - The Mar approach and experience	
Radiation field of a conformal phased array rotational-polarization elements situated		POLLUTION HONITORING	79-34974
surface of revolution	79-32734	Traffic background level and signal duration effects on aircraft noise judgment	
PHOTOGRAHMETRY		y.	79-34580
User's guide to data preparation: Photogram navigation analysis program Fotonap	metric	POLYBUTADIENE Polyurethane foams for aircraft shock mounts.	. 2:
[AD-A064614] N	79-22070	Polybutadiene based foams	
PHYSICAL PROPERTIES Fuel property effects on combustor performance	ce	[AD-A064859] N'	79-23219
aircraft synthetic and petroleum-derived f	uels	Dynamic behavior of aircraft materials	
[ASHE PAPER 79-GT-178] a	79-32438	[AD-A064592]	79-22078

SUBJECT INDEX BADIO DIRECTION PINDERS

POLYURETHANE FOAM		PRODUCTIVITY	
Analysis of the mechanical properties of rigi		Airline productivity redefined - An analysi	s of
foams with particular consideration of a ri	gid	U.S. and European carriers	
polyether structural foam	9-23227	ODOTROM DIABATRO	A79-35100
[BU-229] N7 POLYURETEABE BESIES	3-23221	PROJECT PLANNING European transonic wind tunnel project for	haab
Polyurethane foams for aircraft shock mounts.	2:	Reynolds numbers cryogenic proposal	nign
Polybutadiene based fcams		[AAAP-NT-78-01]	พ79-23118
	9-23219	PROPELLER EPPICIENCY	
POSITION (LOCATION)		Performance estimation for a highly loaded	
Geodesy and coordinate conversion for positio	n	eight-blade propeller combined with an ad	lvanced
determination of aircraft		technology turboshaft engine	
	9-32581		N79-22101
Omega - Global navigating by VLF fix	9-32722	PROPELLERS	
	9-32122	Light propeller aircraft noise	*30 30000
POTENTIAL TERORY Rotary-wing aerodynamics. Volume 1: Basic		Procedure for noise prediction and optimize	A79-34980
theories of rotor aerodynamics with applica	t100	advanced technology propellers	CION OI
to helicopters momentum, vortices, and	CION		N79-22100
potential theory	1	PROPULSION SYSTEM COMPIGURATIONS	
	9-22039	Propulsion system considerations for the su	bsonic
POWER LIBES		V/SIOL	
Evaluation of a remote tone signaling		[ASME PAPER 78-GT-57]	A79-32934
control/monitor system as lightning/transie		Variable cycle engine technology program pl	anning
protection for solid state instrument land:	ng	and definition study	
systems	0 22116		N79-23084
	9-22116 1	PROPULSIVE EPPICIENCY	
PREDICTION ANALYSIS TECHNIQUES Procedure for noise prediction and optimization	on of	Vertical-seeking autopilot design of the vector controlled ejection seat	rust
advanced technology propellers	OH OL		A79-33615
	9-22100 1	PROTECTIVE COATINGS	A79 33013
The generation, radiation and prediction of	,	Erosion resistant clad rotor blades - Eorid	e
supersonic jet noise. Volume 2, appendix:		coatings do the job	
Computer program listing			A79-33590
	9-22854	Tests of NASA ceramic thermal barrier coati	ng for
PREFLIGHT OPERATIONS		gas-turbine engines	
New technology S61N simulator			A79-34996
	9-33458	An evaluation of coatings for steel and tit	
PRESSURE DISTRIBUTION		alloy fasteners for aircraft applications	
Experimental studies of unsteady aerodynamics	ОП		N79-23242
wind tunnel models of helicopter rotors	9-32295		
Design and testing of two supercritical compr		Q	
Design and testing of two supercritical compr cascades	essor	Q FACTORS	
cascades	essor	PACTORS An efficient algorithm for computing the	
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o	essor 9-32330 f	An efficient algorithm for computing the Q-guidance matrix	
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num	essor 9-32330 f ber.	An efficient algorithm for computing the Q-guidance matrix	N79-22074
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome	essor 9-32330 f ber. nts	An efficient algorithm for computing the Q-guidance matrix	N79-22074
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] A7	essor 9-32330 f ber. nts 9-32386	An efficient algorithm for computing the Q-guidance matrix [AD-A064816]	N79-22074
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential pre-	essor 9-32330 f ber. nts 9-32386 ssure	An efficient algorithm for computing the Q-guidance matrix [AD-A064816]	N79-22074
cascades [ASME PAPER 79-GT-11] A7 Aerodynamic and aeroelastic characteristics o oscillating loaded cascades at low Hach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential pre and temperature distortions in multistage a	essor 9-32330 f ber. nts 9-32386 ssure	An efficient algorithm for computing the Q-guidance matrix [AD-A064816]	N79-22074
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential prediction of steady, circumferential prediction compressors	essor (9-32330 f fber. nts 9-32386 ssure	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAN BEACONS Beacon-based collision avoidance system -	พ79-22074
cascades [ASME PAPER 79-GT-11] AFOODynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] A7	essor (9-32330 f f f f f f f f f f f f f f f f f f	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAN BEACONS Beacon-based collision avoidance system - Experimental results	N79-22074 N79-33606
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential prediction of steady, circumferential prediction compressors [ASME PAPER 79-GT-184] Arroduction and measurement of the aerodynamic forces and pressure distributions of wing-t-	essor (9-32330 f ber. nts 9-32386 ssure x1al f 9-32443	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAN BEACONS Beacon-based collision avoidance system - Experimental results	
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential premand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-temperatures at very high angles of attactions.	essor (9-32330 f ber. nts 9-32386 ssure x1al F 9-32443 all k	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAN BEACONS Beacon-based collision avoidance system - Experimental results	A79-33606
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential premand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-t configurations at very high angles of attactivations.	essor (9-32330 ff ber. nts 9-32386 ssure xial F9-32443 ail k	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR WAVIGATION The principle and practice of 'clutch' rada operation	A79-33606 r
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential premand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-ticonfigurations at very high angles of attact of the service o	essor (9-32330 f ber. nts 9-32386 ssure x1al f 9-32443 a1l k 9-22025	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation	A79-33606
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential premaind temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-temperatures are supersonic configurations at very high angles of attact of the service of the service of the service of the service of attact of the service of the service of the service of attact of the service	essor (9-32330 f ber. nts 9-32386 ssure x1al f 9-32443 a1l k 9-22025	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR BAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING	A79-33606 E A79-33025
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics o oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential preand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wingstrong at very high angles of attact of the service of the service airplane configuration at Mach numbers of 2.96, 3.30	essor (9-32330 ff ber. nts 9-32386 ssure x1al ff 9-32443 all k 9-22025 .30, ff	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation BADAR TRACKING Geodesy and coordinate conversion for positi	A79-33606 E A79-33025
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential prediction of steady, circumferential prediction compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-ticonfigurations at very high angles of attact of the service of the service airplane configuration at Mach numbers of 22.96, 3.30 [NASA-TH-80061] N7	essor (9-32330 f ber. nts 9-32386 ssure xial f be yellow	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft	A79-33606 r A79-33025
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-temperatures at very high angles of attact of the series of a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] No investigation into the pressure distributions.	essor (9-32330 f ber. nts 9-32386 ssure xial I 9-32443 ail k 9-22025 .30, I 9-22051 ons	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft	A79-33606 r A79-33025 lon A79-32581
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential presand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-teconfigurations at very high angles of attactions at very high angles of attactions are configuration at Mach numbers of 2 2.96, 3.30 [NASA-TM-80061] An investigation into the pressure distributioner a wing and store combination at low specific parts of the service and pressure distributions of a supersonic cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TM-80061]	essor (9-32330 f ber. nts 9-32386 ssure xial I 9-32443 ail k 9-22025 .30, I 9-22051 ons	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft	A79-33606 r A79-33025 lon A79-32581
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential presand temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wingstrong tooling the configurations at very high angles of attact N7 Surface pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TM-80061] An investigation into the pressure distributioner a wing and store combination at low specific processing and store combination at lo	essor (9-32330 f ber. nts 9-32386 ssure x1al f 9-32443 all k 9-22025 .30, f 9-22051 ons eeds 9-23047	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state	A79-33606 r A79-33025 lon A79-32581
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present the state of	essor (9-32330 ff ber. nts 9-32386 ssure xial ff be year 19-32443 ff be year 22025 ff be year 20051 ons eeds 9-23047	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state	A79-33606 r A79-33025 lon A79-32581 ets
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-temperatures at very high angles of attactions are pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] No investigation into the pressure distribution at very and and store combination at low specific at a very service and store combination at low specific and supersonic attactions and store combination at low specific and supersonic attactions and store combination at low specific attactions at low specific attactions and store combination at low specific attactions and store combination at low specific attactions at low specific att	essor (9-32330 ff ber. nts 9-32386 ssure xial ff be year 19-32443 ff be year 22025 ff be year 20051 ons eeds 9-23047	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045]	A79-33606 r A79-33025 lon A79-32581 ets N79-23318
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present the pressure distributions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact N7 Surface pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific processing the process of the pressure distribution of the pressure distribution over a wing and store combination at low specific process of the pressure distribution of the pressure distribution over a wing and store combination at low specific process of the pressure distribution of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and store combination at low specific process of the pressure distribution over a wing and	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-22025 .30, 9-22051 ons eeds 9-23047	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-modeling and the state of the state	A79-33606 r A79-33025 lon A79-32581 ets N79-23318
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-teconfigurations at very high angles of attactions at very high angles of attactions are configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific processing testing time requirements in steady and unsteady measurements N7: Wall interference effects	essor (9-32330 f f ber. nts 9-32386 ssure x1al F 9-32443 all k 99-22025 30, I 9-22051 ons eeds 9-23047	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R BADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation BADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] BADIO ANTERNAS Experimental analysis of V.H.F. antennas fo helicopter homing systems using scale-mod techniques	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact of the configurations at very high angles of attact airplane configuration at Mach numbers of 2 2.96, 3.30 [MASA-TM-80061] An investigation into the pressure distribution over a wing and store combination at low specific services are supported by the story of the services of t	essor (9-32330 f ber. nts 9-32386 ssure xial f s 9-32443 ail k 9-22025 .30, f 9-22051 ons eeds 9-23047 f 9-23112 f 1nd	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.F. antennas for helicopter homing systems using scale-mod techniques	A79-33606 r A79-33025 lon A79-32581 ets N79-23318
cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present of the prediction of steady, circumferential present of the compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact N7 Surface pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TM-80061] N7 An investigation into the pressure distribution over a wing and store combination at low specific production of the standard and unsteady measurements N7: Wall interference effects N7: The effect of blockage in shear flow in the within the content of the pressure of the	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTHRAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques	A79-33606 r A79-33025 100 A79-32581 ets N79-23318 r e1 A79-34392
cascades [ASME PAPER 79-GT-11] Arodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and nome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-teconfigurations at very high angles of attactions and measurement of the aerodynamic forces and pressure distributions of wing-teconfigurations at very high angles of attaction at mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific and supersonic cruise are wing and store combination at low specific	essor (9-32330 f ber. nts 9-32386 ssure xial f s 9-32443 ail k 9-22025 .30, f 9-22051 ons eeds 9-23047 f 9-23112 f 1nd	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.F. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Kiniature flow-direction and airspeed senso	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attaction forces and pressure distributions of wing-tonfigurations at very high angles of attaction and measurement of the aerodynamic forces and pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low sports and and store combination at low sports and unsteady measurements Wall interference effects The effect of blockage in shear flow in the within and store are selected. The effect of blockage in shear flow in the within and store are selected. PRESSURE BEASUREMENTS	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-32443 ail p-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind 9-23125	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact N7 Surface pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TM-80061] N7 An investigation into the pressure distribution over a wing and store combination at low specific [BU-226] Notes concerning testing time requirements in steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the within a content of the pressure distribution of the pressure distribution of the pressure distribution over a wing and store combination at low specific steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the within a content of the pressure distribution of the p	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-32443 ail p-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind 9-23125	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTHRNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attaction and measurement of the aerodynamic samplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific samples of the service of the se	essor (9-32330 ff ber. nts 9-32386 ssure xial F 9-32443 ail k 99-32443 ail k 99-22025 30, I 9-22051 ons eeds 9-23047 F 9-23112 9-23113 ind F 9-23125 tips	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTHRAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies	A79-33606 r A79-33025 100 A79-32581 ets N79-23318 r el A79-34392 r for spin
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact arrivations at very high angles of attact arrivation and measurement of the aerodynamic forces and pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific steady and upsteady measurements Wall interference effects The effect of blockage in shear flow in the withinnel [BU-221] PRESSURE MEASUREMENTS Unsteady pressure measurements on rotor blade with incidence	essor (9-32330 f ber. nts 9-32386 ssure xial F 9-32443 ail k 9-22025 .30, F 9-22051 ons eeds 9-23112 9-23113 ind F 9-23125 tips 9-34534 F	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR MAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [MASA-TP-1467] RADIO DIRECTION FINDERS	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el A79-34392 r for spin
Cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attack of the configurations at very high angles of attack of the configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific concerning testing time requirements in steady and upsteady measurements Wall interference effects The effect of blockage in shear flow in the within the concerning testing time requirements in steady and upsteady measurements The effect of blockage in shear flow in the within the concerning testing time requirements in steady and upsteady measurements Wall interference effects The effect of blockage in shear flow in the within the concerning testing time requirements in steady and upsteady measurements on rotor blade with incidence Affect of number of probes and their orientation the calculation of several compressor face	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-22025 .30, 9-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind 9-23125 tips 9-34534 ion	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR WAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION PINDERS The measurement of RP-pulse phase and ampliate landing system DLS	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in
cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attaction and measurement of the aerodynamic forces and pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [MASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specification and mach numbers of 2 2.96 and upsteady measurements Wall interference effects The effect of blockage in shear flow in the winnel [BU-221] PRESSURE MEASUREMENTS Unsteady pressure measurements on rotor blade with incidence Effect of number of probes and their orientation the calculation of several compressor factorion descriptors	essor (9-32330 ff ber. nts 9-32386 ssure xial F 9-32443 ail k 9-22025 .30, F 9-22051 ons eeds 9-23112 9-23113 ind F 9-23125 tips 9-34534 F 100 ce	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR MAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [MASA-TP-1467] RADIO DIRECTION PINDERS The measurement of RP-pulse phase and amplithe landing system DLS	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608
Cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact N7 Surface pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] N7 An investigation into the pressure distribution over a wing and store combination at low specific [BU-226] Notes concerning testing time requirements in steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the with incidence PRESSURE BEASUREBERTS Unsteady pressure measurements on rotor blade with incidence Arrivation descriptors [NASA-TH-72859] N75	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-22025 .30, 9-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind 9-23125 tips 9-34534 ion	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ABTHRAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION FINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-f	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608
Cascades [ASME PAPER 79-GT-11] Arrodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present of the aerodynamic flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wingstones and pressure distributions of wingstones and pressure distributions of attactions at very high angles of attactions at very high angles of attactions are plane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific standards and unsteady measurements in steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the with unnel [BU-221] PRESSURE BEASUREBERTS Unsteady pressure measurements on rotor blade with incidence Effect of number of probes and their orientation the calculation of several compressor faintstortion descriptors [NASA-TH-72859] N79 PROBES	essor (9-32330 ff ber. nts 9-32386 ssure xial F 9-32443 ail k 9-22025 .30, F 9-22051 ons eeds 9-23112 9-23113 ind F 9-23125 tips 9-34534 F 100 ce	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR WAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION FINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-fantennas operating on the basis of the	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608
Cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attaction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attaction at mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low spoods and unsteady measurements Wall interference effects The effect of blockage in shear flow in the with tunnel [BU-221] PRESSURE MEASUREMENTS Unsteady pressure measurements on rotor blade with incidence Affect of number of probes and their orientation the calculation of several compressor fact distortion descriptors [NASA-TH-72859] PROBES Two dimensional anemometric probe two	essor (9-32330 ff ber. nts 9-32386 ssure xial F 9-32443 ail k 9-22025 .30, F 9-22051 ons eeds 9-23112 9-23113 ind F 9-23125 tips 9-34534 F 100 ce	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR MAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for positive determination of aircraft Radar track data correlation or reachable sizevisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION PINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-fantennas operating on the basis of the comparison method	A79-33606 r A79-33025 lon A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608 inder
Cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attack Notes airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] Notes concerning the pressure distribution over a wing and store combination at low specific [BU-226] Notes concerning testing time requirements in steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the with incidence Affect of number of probes and their orientation the calculation of several compressor faid distortion descriptors [NASA-TH-72859] PROBES Two dimensional anemometric probe two dimensional flow. Wind tunnel tests	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23112 9-23125 tips 9-34534 ind ee 9-23087	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR HAVIGATION The principle and practice of 'clutch' rada operation RADAR TEACKING Geodesy and coordinate conversion for posit determination of aircraft Radar track data correlation or reachable s revisited: The reachable state [AD-A065045] RADIO ANTHRAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-mod techniques RADIO CONTROL Miniature flow-direction and airspeed senso airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION FINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-fantennas operating on the basis of the comparison method	A79-33606 r A79-33025 100 A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608 inder
Cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present distributions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attact of steady and pressure data for a supersonic-cruise airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] An investigation into the pressure distribution over a wing and store combination at low specific steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the within the steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the within the summel [BU-221] PRESSURE HEASUREMENTS Unsteady pressure measurements on rotor blade with incidence Effect of number of probes and their orientation the calculation of several compressor fact distortion descriptors [NASA-TH-72859] NASA-TH-72859] PROBES Two dimensional anemometric probe two dimensional flow. Wind tunnel tests [AAAF-NT-78-09] NASA-TH-78-09] NASA-TH-78-09]	essor (9-32330 ff ber. nts 9-32386 ssure xial F 9-32443 ail k 9-22025 .30, F 9-22051 ons eeds 9-23112 9-23113 ind F 9-23125 tips 9-34534 F 100 ce	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR WAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for positive determination of aircraft Radar track data correlation or reachable sizevisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-moditechniques RADIO CONTROL Miniature flow-direction and airspeed sensor airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION FINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-fantennas operating on the basis of the comparison method Correlation-extremal direction finding of experiments.	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608 inder A79-35502 xtended
Cascades [ASME PAPER 79-GT-11] Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach num I - Pressure distribution, forces, and mome [ASME PAPER 79-GT-111] The prediction of steady, circumferential present and temperature distortions in multistage at flow compressors [ASME PAPER 79-GT-184] Prediction and measurement of the aerodynamic forces and pressure distributions of wing-tonfigurations at very high angles of attack Notes airplane configuration at Mach numbers of 2 2.96, 3.30 [NASA-TH-80061] Notes concerning the pressure distribution over a wing and store combination at low specific [BU-226] Notes concerning testing time requirements in steady and unsteady measurements Wall interference effects The effect of blockage in shear flow in the with incidence Affect of number of probes and their orientation the calculation of several compressor faid distortion descriptors [NASA-TH-72859] PROBES Two dimensional anemometric probe two dimensional flow. Wind tunnel tests	essor 9-32330 f ber. nts 9-32386 ssure xial 9-32443 ail k 9-32443 ail k 9-22025 .30, 9-22051 ons eeds 9-23047 9-23112 9-23113 ind 9-23125 tips 9-34534 ion ce 9-23087	An efficient algorithm for computing the Q-guidance matrix [AD-A064816] R RADAR BEACONS Beacon-based collision avoidance system - Experimental results RADAR MAVIGATION The principle and practice of 'clutch' rada operation RADAR TRACKING Geodesy and coordinate conversion for positive determination of aircraft Radar track data correlation or reachable sizevisited: The reachable state [AD-A065045] RADIO ANTENNAS Experimental analysis of V.H.P. antennas for helicopter homing systems using scale-moditechniques RADIO CONTROL Miniature flow-direction and airspeed sensor airplanes and radio controlled models in studies [NASA-TP-1467] RADIO DIRECTION PINDERS The measurement of RP-pulse phase and amplithe landing system DLS Optimal excitation of amplitude-direction-functions operating on the basis of the comparison method Correlation-extremal direction finding of eand point sources of electromagnetic osci	A79-33606 r A79-33025 101 A79-32581 ets N79-23318 r el A79-34392 r for spin N79-23081 tude in A79-34608 inder A79-35502 xtended

RADIO FREQUENCY INTERFERENCE Suppression of radio-electrical disturbance	es of	CFR Vehicle design and performance objection of the crash fire Rescue	ves
electrostatic origin on aircraft	A79-34978	Analysis of visual detection performance:	A79-33612
RADIO MAVIGATION Omega - Global navigating by VLP fix	179-34570	1978 experiment [AD-A065118]	N79-23061
The measurement of RF-pulse phase and ampl	A79-32722	RESEARCH AND DRVELOPMENT The combustion of a range of distillate fue	
the landing system DIS		small gas turbine engines	
RADIO TRACKING	A79-34608	[ASME PAPER 79-GT-175] RESEARCH PROJECTS	A79-32435
Radio~engineering tracking systems RANDOM LOADS	A79-35501	Ames Research Center publications, 1977 [NASA-TM-78514] RESONANT VIBRATION	N79-22957
Response of plate to nonstationary random	load 1079-34604	Friction damping of resonant stresses in greaturbine engine airfoils	as
RANDOM VIBRATION Response of plate to nonstationary random		[ASME PAPER 79-GT-109] REVERSED PLOW	A79-32384
RANGE PINDERS	A79-34604	The combustion of a range of distillate fur small gas turbine engines	els in
Parametric analysis of stereometric tracker use in tactical aircraft	r for	[ASME PAPER 79-GT-175] REVIEWING	A79-32435
[AD~A064688] RECTANGULAR PLATES	N79-22086	Carbon Fiber Risk Analysis: Conclusions	N79-22209
Response of plate to nonstationary random		REYNOLDS NUMBER	
RECTANGULAR WINGS	A79-34604	Visualisations and calculations of air into high angles of attack and low Reynolds no	
Bumblebee Program: Aerodynamic data. Par- Wing loads at Mach numbers 1.5 and 2.0 -		Navier-Stokes equation	N79-22030
missile configurations [NASA-CR-3117]	N79-22041	calibration of the AEDC-PWT 16-foot transortunnel aerodynamic test section at various	
An experimental passive microwave attitude		Reynolds numbers [AD-A065112]	พ79-22117
measurement system for escape system ste	ering A79-33637	The effect of surface imperfections on the aerodynamic performance of an airfoil at	
REGIONAL PLANNING Off-airport land use compatibility - The Ma		moderate Reynolds numbers [BU-217]	N79-23048
approach and experience	A79-34974	The design of models and their supports, to clean-flow tunnel. A review of some of	he Evans
REGRESSION ANALYSIS Regression simulation of turbine engine	A79-34974	various proposals the design of high Reynolds number, transonic wind tunnels	rne
performance/aircraft regression model	N79-22106	European transonic wind tunner project for	N79-23110
[AD-A063975] REGULATIONS	N/3-22100	Reynolds numbers cryogenic proposal	
Active control transport design criteria [PAPER-6663] RELEASING	N79-23065	[AAAF-MT-78-01] Construction problems specific to models for Reynolds number wind tunnels scale models for the second	odels
Carbon Fiber Risk Analysis: Conclusions	N79-22209	[AAAF-NT-78-02] RIDING QUALITY	N79-23124
BELIABILITY AWALYSIS Basis for an objective evaluation of the particular particular and particular	aratroop	Physical and subjective studies of aircraft interior noise and vibration	t
Jumping reliability	A79-33619	[NASA-TM-80084] RIGID STRUCTURES	N79-23754
Evaluation applied to reliability analysis reconfigurable, highly reliable, fault-to	of	Analysis of the mechanical properties of rifoams with particular consideration of a	
computing systems [NASA-TM-80090]	N79-22783	polyether structural foam [BU-229]	N79-23227
RELIABILITY ENGINEERING		RISK	NI ZJELI
The influence of the blading surface rough the aerodynamic behavior and characteris		Carbon fibers and composites	N79~22199
an axial compressor [ASME PAPER 79-GT-102]	A79-32378	Source of released carbon fibers	N79~22200
Ejection systems in the year 2000	A79-33622	An assessment of local risk to area as: with commercial operations of aircraft w	
Omega possibilities: Limitations, options opportunities		graphite fiber composite structures	N79-22207
[AD-A065027] REMOTE CONTROL	N79-23063	An assessment of national risk: General co and overall approach carbon fiber	
Evaluation of a remote tone signaling control/monitor system as lightning/trans	sient	utilization in commercial aviation	N79~22208
protection for solid state instrument lassystems		Carbon Fiber Risk Analysis: Conclusions	N79-22209
[AD-A063766] REMOTE SENSORS	N79-22116	BOCKET FLIGHT Dynamic stability of a flight vehicle laying	
Detection of CAT and low altitude wind she on-board aircraft IR sensors - An update		an uncoiling line	A79~32919
·	A79-33630	ROTARY WINGS	
Miniature flow-direction and airspeed sense airplanes and radio controlled models in		Review of problems of unsteady aerodynamic: belicopters	
studies [NASA-TP-1467]	N79-23081	Retreating blade and dynamic stall for	A79-32293
REMOTELY PILOTED VEHICLES RPV electric power system study. Phase 2:	Hot	helicopter rotors	A79~32294
bench mockup develorment [AD-A065008]	N79-22110	Experimental studies of unsteady aerodynam: wind tunnel models of helicopter rotors	
RESCUE OPERATIONS Aviation emergency procedures		Prosion resistant clad rotor blades - Borio	A 7 9~32295 de
	A79-33611	coatings do the job	A79~33590

SUBJECT INDEX SPARCHING

Unsteady pressure measurements on rotor blad with incidence		eliminary design study of a composite man blade for the OH-58 helicopter. Volume	1:
The derivation of a thickness noise formula	for	Trade analysis and preliminary design stucomposite OB-58 main rotor blade	
the far-field by Isom applied to helic rotors	ROTOR	[AD-A064159] BLADES (TURBOHACHINERT)	N79-22080
Experimental investigation of three helicopt		rced vibrations of a single stage axial compressor rotor	
rotor airfoils designed analytically i	n the	[ASHE PAPER 79-GT-108]	A79-32383
Langley 6 by 19 inch and 6 by 28 inch tran wind tunnels		rodynamic and aeroelastic characteristics oscillating loaded cascades at low mach r	
	79-22037	[ASME PAPER 79~GT-112]	A79-32387
Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applic	ation Up	timization for rotor blades of tandem des axial flow compressors	sign for
to helicopters momentum, vortices, and		[ASBE PAPER 79-GT-125]	A79-3239
potential theory [NASA-CR-3082] N		ree-dimensional lifting-surface theory fo annular blade row	or an
OH-58 composite main rotor blades preliminar	y ([ASME PAPER 79-GT-182]	A79-32441
	79-22085	eliminary studies using photon correlation velocimetry in turbomachinery and combust	
Design and development of a motion compensat the RSRA main rotor control	or for	systems	170-2021
	79-22541 Ad	vanced composite engine rotor design	A79-34314
Studies of the dynamic stall or airfoil prof for helicopter rotors		[AD-A063843]	N79-22105
[AD-A065106] N		e fluid dynamic design of advanced centri compressors	LLUYAL
ROTATING BODIES Radiation field of a conformal phased array	of ROTOR	SYSTEMS RESEARCH AIRCRAFT	N79-22508
rotational-polarization elements situated	on a He	licopter emergency escape	
surface of revolution	79-32734 De:	sign and development of a motion compensa	A79-33626
ROTATING STALLS		the RSRA main rotor control	
Retreating blade and dynamic stall for helicopter rotors	ROTOR	S	N79-22541
À	79-32294 La:	ser balancing demonstration on a high-spe	eed
ROTOR APPRODYNAMICS Review of problems of unsteady aerodynamics		flexible rotor [ASME PAPER 79-GT-56]	A79-32351
helicopters	E1	astomer mounted rotors - An alternative f	
Retreating blade and dynamic stall for		smoother running turbomachinery [ASME PAPER 79-GT-149]	A79-32414
helicopter rotors	Th	e effects of design and operating variabl	
Experimental studies of unsteady aerodynamic		the response of an axial flow fan to inle distortions	3£ 110#
wind tunnel models of helicopter rotors			
		[NASA-CR-158522]	N79-22087
An off-design correlation of part span dampe	79-32295 An	[NASA-CR-158522] experimental study of the response of a turbo-machine rotor to a low frequency in	
A An off-design correlation of part span dampe losses through transonic axial fan rotors	79-32295 An	experimental study of the response of a turbo-machine rotor to a low frequency in distortion	nlet
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A Aerodynamic and aeroelastic characteristics	79-32295 An r 79-32329 (experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776]	
A An off-design correlation of part span dampe losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu	79-32295 An r 79-32329 of mber	experimental study of the response of a turbo-machine rotor to a low frequency in distortion	nlet
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPER 79-GT-112] Optimization for rotor blades of tandem desi	79-32295 An r 79-32329 of mber 79-32387 gn for S-61	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HELICOPTER	nlet
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] A	79-32295 An r 79-32329 [of mber 79-32387 gn for S-61 Ne 79-32394	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HBLICOPTER w technology S61N simulator	nlet
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPER 79-GT-112] Optimization for rotor tlades of tandem desi axial flow compressors [ASME PAPER 79-GT-125] The prediction of steady, circumferential preserved.	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ne 79-32394 essure SAPET:	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HELICOPTER w technology S61N simulator J DEVICES	n1et N79-23089
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] A	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ne 79-32394 essure SAPET:	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HBLICOPTER v technology S61N simulator Y DBVICES ection systems in the year 2000	n1et N79-23089
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPER 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPER 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPER 79-GT-184]	79-32295 An r 79-32329 of mber 79-32387 gn for S-61 Ne r9-32394 essure SAPET axial Ej r9-32443 U.:	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HBLICOPTER v technology S61N simulator Y DBVICES ection systems in the year 2000	n1et N79-23089 N79-33458 N79-33622
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPER 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPER 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors	79-32295 An 79-32329 90 f mber 79-32387 gn for S-61 Nev essure SAPET: axial Ej: 79-32443 U.:	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER w technology S61N simulator 7 DEVICES ection systems in the year 2000	alet N79-23089 A79-33458 A79-33623 A79-33623
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ne 79-32394 essure SAPET: axial Ej 79-32443 foil Hi 79-34531	experimental study of the response of a turbo-machine rotor to a low frequency in distortion [AD-A064776] S HELICOPTER w technology S61N simulator I DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems	a79-23089 a79-33458 a79-33622 ing a79-33623 anel
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] A reodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPER 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPER 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPER 79-GT-184] A Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor blade with incidence	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ne 79-32394 essure SAPET: axial Ej 79-32443 foil Hi 79-34531 e tips Dea	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator 7 DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape	a79-23089 a79-23089 a79-33458 a79-33623 a79-33623
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A reodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPER 79-GT-112] A reodynamic and rotor thades of tandem desi axial flow compressors [ASHE PAPER 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASHE PAPER 79-GT-184] A reduced the production of steady compressors [ASHE PAPER 79-GT-184] A reduced temperature distortions in multistage flow compressors [ASHE PAPER 79-GT-184] A reduced temperature distortions in multistage flow compressors [ASHE PAPER 79-GT-184] A reduced temperature distortions in multistage flow compressors [ASHE PAPER 79-GT-184] A reduced temperature distortions of oscillating air surfaces in a supersonic flowfield a with incidence	79-32295 An 79-32399 of mber 79-32387 gn for S-61 Nev essure SAPET: axial Ej: 79-32443 U.: 79-32443 U.: 79-34531 e tips De:	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems	A79-33458 A79-33458 A79-33623 A79-33623 A79-33639 System
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desianial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formula the far-field by Isom applied to helici	79-32295 An 79-32329 of but bet bet bet bet bet bet bet bet bet be	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator 7 DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft f	A79-33623 A79-33623 A79-33623 A79-33639 E System
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formula the far-field by Isom applied to helications	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ner 79-32394 essure SAPET axial Ej 79-32443 U.: 79-32443 foil Hi 79-34531 e tips Dea 79-34534 for opter App	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER w technology S61N simulator Y DBVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft for detection systems	A79-33458 A79-33623 ing A79-33623 e system A79-33640 fire
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desianial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formula the far-field by Isom applied to helicitotors Experimental investigation of three helicoptic	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Ne 79-32394 essure SAPET: axial Ej: 79-32443 U.: 79-34531 e tips Dear 79-34534 for opter App 79-334549 er SAPET:	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator 7 DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] 7 BABAGGREENT	A79-33623 A79-33623 A79-33623 A79-33639 E System
An off-design correlation of part span damper losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A herodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A horozonic axial flow compressors [ASHE PAPEE 79-GT-125] A horozonic axial flow compressors [ASHE PAPEE 79-GT-125] A horozonic axial flow compressors [ASHE PAPEE 79-GT-125] A horozonic axial flow compressors [ASHE PAPEE 79-GT-184] A horozonic flowfield A horozonic flowfie	79-32295 An 79-32399 of mber 79-32387 gn for S-61 Ne sessure SAPET: axial Ej 79-32443 U.: 79-32443 U.: 79-34531 Hi e tips De for for Ap 79-34534 for	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER w technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974]	A79-33458 A79-33622ing A79-33623ing A79-33639 e system A79-33640fire N79-22882
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desiatial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Altime-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formula the far-field by Isom applied to helicitotors Experimental investigation of three helicoptrotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transpired in the far-wind tunnels	79-32295 An 79-32399 To be to the total and the total an	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator 7 DBVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] 7 HANAGEMENT 1ation emergency procedures LITE WAVIGATION SYSTEMS	A79-33458 A79-33623 ing A79-33623 e system A79-33640 fire
An off-design correlation of part span damper losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A Perodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A Perodynamic and compressors [ASHE PAPEE 79-GT-125] A Perodynamic attaction of steady, circumferential prince and temperature distortions in multistage flow compressors [ASHE PAPEE 79-GT-184] A PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formulating the far-field by Isom applied to helicators Experimental investigation of three helicoptications are found to the far-field sesigned analytically in Langley 6 by 19 inch and 6 by 28 inch transwind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Nev 8essure SAPET: axial Ej: 79-32443 U.: 6011 His 6011 His 6017 607-34531 De 607-34534 De 607-607-607-607-607-607-607-607-607-607-	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER w technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] Y BANAGEBERT intion emergency procedures	A79-33458 A79-33622ing A79-33623ing A79-33639 e system A79-33640fire N79-22882
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] And temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] And temperature distortions of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor blade with incidence The derivation of a thickness noise formula the far-field by Isom applied to helicitotors Experimental investigation of three helicoptrotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transum tunnels [NASA-TP-1396] Botary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applice	79-32295 An 79-32399 To be to the total and the total an	experimental study of the response of a turbo-machine rotor to a low frequency industortion [AD-A064776] S HELICOPTER ** technology S61N simulator *** DBVICES** ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] *** MANAGEMENT** 1 THE MAVIGATION SYSTEMS** vigation by satellites For analysis of a satellite interferometee	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 Eire N79-22882 A79-33611
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A Perodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A Perodynamic and compressors [ASHE PAPEE 79-GT-125] A Perodynamic for rotor thades of tandem desi axial flow compressors [ASHE PAPEE 79-GT-125] A Perodiction of steady, circumferential prince and temperature distortions in multistage flow compressors [ASHE PAPEE 79-GT-184] A PAPEE 79-GT-184] A PAPEE 79-GT-184] A PAPEE 79-GT-184 [A PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield a PAPEE 79-GT-184 [A PAPEE 79-GT-184] A PAPEE 79-GT-184 [A PAPEE	79-32295 An 79-32329 79-32387 gn for S-61 Nev 8essure SAPET: axial Ej: 79-32443 U.: 79-32443 U.: 79-34531 Ei: 6 tips Dea 79-34534 for opter Ap; 79-35449 er SAPET: 8 The soonic SATEL: 79-22037 Nat	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER v technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft detection systems [AD-A063974] Y ANAGEMENT iation emergency procedures LITE HAVIGATION SYSTEMS vigation by satellites	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 Eire N79-22882 A79-33611
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor blades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formulatine far-field by Isom applied to helicotors Experimental investigation of three helicopterotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transwind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applicate helicopters momentum, vortices, and potential theory [NASA-CR-3082]	79-32295 An 79-32399 To the first term of the	experimental study of the response of a turbo-machine rotor to a low frequency industortion [AD-A064776] S HELICOPTER ** technology S61N simulator ****T DBVICES*** **ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] ***********************************	A79-33458 A79-33622 A79-33623 A79-33639 A79-33640 A79-22882 A79-33611
An off-design correlation of part span dampe losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A herodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A horizonic for rotor thades of tandem desi axial flow compressors [ASHE PAPEE 79-GT-125] A horizonic flow compressors [ASHE PAPEE 79-GT-125] A horizonic flow compressors [ASHE PAPEE 79-GT-184] A horizonic flow compressors [ASHE PAPEE 79-GT-184] A horizonic flow compressors [ASHE PAPEE 79-GT-184] A horizonic flowfield are surfaces in a supersonic flowfield with incidence The derivation of a thickness noise formulating the far-field by Isom applied to helicitors Experimental investigation of three helicoptic rotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transvind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with application helicopters momentum, vortices, and potential theory [NASA-CR-3082] NASA-CR-3082] NASA-CR-	79-32295 An 79-32329 of mber 79-32387 gn for S-61 Nev ressure SAPET: axial Ej: 79-32443 U.: 79-32443 U.: 79-34531 Ei: respective App 79-34534 for opter App 79-35449 SAPET or SAPET Av: soon.c SATEL Nation Eri	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER **v technology S61N simulator **J DEVICES** ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] **Y ANAGEMENT** lation emergency procedures LITE NAVIGATION SISTEMS vigation by satellites ror analysis of a satellite interferometer in avigation system [NASA TASK 3] LITE NETWORKS vigation by satellites	A79-33458 A79-33622 A79-33623 A79-33639 A79-33640 A79-22882 A79-33611
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor tlades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formulatine far-field by Isom applied to helicotors Experimental investigation of three helicopterotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transwind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applicate helicopters momentum, vortices, and potential theory [NASA-CR-3082] ROTOR BLADES Retreating blade and dynamic stall for helicopter rotors	79-32295 An 79-32399 To the first term of the	experimental study of the response of a turbo-machine rotor to a low frequency industortion [AD-A064776] S HELICOPTER w technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] Y HANAGENERT lation emergency procedures LITE HAVIGATION SYSTEMS vigation by satellites ror analysis of a satellite interferomete navigation system [NASA TASK 3] LITE BETWORKS vigation by satellites BEIGET	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 Ere N79-22882 A79-33611 A79-32582
An off-design correlation of part span damper losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A Perodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A Perodynamic and compressors [ASHE PAPEE 79-GT-125] A Perodynamic at the prediction of steady, circumferential primard temperature distortions in multistage flow compressors [ASHE PAPEE 79-GT-184] A PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield a Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formulating the far-field by Isom applied to helicorotors Experimental investigation of three helicoptic rotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transwind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applicate theory with a perodynamics with applicate theory with a perodynamics with a perodynamics with a perodynam	79-32295 An 79-32329 79-32387 gn for S-61 Nev 8essure SAPET: 79-32394 8essure SAPET: 79-32443 U.: 79-34531 E1: 79-34534 for popter Ap; 79-35449 Son SATEL: 79-22037 Nation Eri 79-22039 SATEL: 79-32294 The	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER ** technology S61N simulator *** DBVICES** ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedecction systems [AD-A063974] *** MANAGEMENT** iation emergency procedures LITE NAVIGATION SYSTEMS vigation by satellites ravigation system [NASA TASK 3] LITE NETWORKS vigation by satellites BEIGET e role of the backside parameter in heigh	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 Ere N79-22882 A79-33611 A79-32582
An off-design correlation of part span damper losses through transonic axial fan rotors [ASHE PAPEE 79-GT-6] A herodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASHE PAPEE 79-GT-112] A horizonic for rotor thades of tandem desi axial flow compressors [ASHE PAPEE 79-GT-125] A horizonic flow compressors [ASHE PAPEE 79-GT-125] A horizonic flow compressors [ASHE PAPEE 79-GT-184] A horizonic flow field a surfaces in a supersonic flow field a surfaces in a supersonic flow field a horizonic flow field a horizonic flow field a surfaces in a supersonic flow field a horizonic flow field a horizonic flow field a horizonic flow field flow flow flow flow flow flow flow flow	79-32295 An 79-32295 T 79-32329	experimental study of the response of a turbo-machine rotor to a low frequency industortion [AD-A064776] S HELICOPTER w technology S61N simulator Y DEVICES ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedetection systems [AD-A063974] Y HANAGENERT lation emergency procedures LITE HAVIGATION SYSTEMS vigation by satellites ror analysis of a satellite interferomete navigation system [NASA TASK 3] LITE BETWORKS vigation by satellites HEIGHT e role of the backside parameter in heigh BING	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 Ere N79-22882 A79-33611 A79-32582 Er A79-35097 A79-32582
An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach nu [ASME PAPEE 79-GT-112] Optimization for rotor tlades of tandem desi axial flow compressors [ASME PAPEE 79-GT-125] The prediction of steady, circumferential prand temperature distortions in multistage flow compressors [ASME PAPEE 79-GT-184] Time-variant aerodynamics of oscillating air surfaces in a supersonic flowfield Unsteady pressure measurements on rotor bladwith incidence The derivation of a thickness noise formulatine far-field by Isom applied to helicotors Experimental investigation of three helicopter rotor airfoils designed analytically in Langley 6 by 19 inch and 6 by 28 inch transwind tunnels [NASA-TP-1396] Rotary-wing aerodynamics. Volume 1: Basic theories of rotor aerodynamics with applicate helicopters momentum, vortices, and potential theory [NASA-CR-3082] ROTOR BLADES Retreating blade and dynamic stall for helicopter rotors Experimental studies of unsteady aerodynamics wind tunnel models of helicopter rotors	79-32295 An 79-32329 79-32387 gn for S-61 Nev 8essure SAPET: 79-32394 8essure SAPET: 79-32443 U.: 79-34531 Ej: 6 t lps Dea 79-34534 For 79-34534 For 79-34534 Son 79-22037 An 8ation Eri 79-22039 SATEL: Nav 79-32294 The 80 ON SEARC: 79-32295 An 81	experimental study of the response of a turbo-machine rotor to a low frequency indistortion [AD-A064776] S HELICOPTER ** technology S61N simulator *** DBVICES** ection systems in the year 2000 S. Navy developments in crashworthy seating strength stitching for aircraft person restraint systems ath by misadventure helicopter escape proposals plicability of fiber optics to aircraft fedecction systems [AD-A063974] *** MANAGEMENT** iation emergency procedures LITE NAVIGATION SYSTEMS vigation by satellites ravigation system [NASA TASK 3] LITE NETWORKS vigation by satellites BEIGET e role of the backside parameter in heigh	A79-33623 A79-33623 A79-33623 A79-33639 System A79-33640 A79-33611 A79-32582 A79-35097 A79-32582

SEATS SUBJECT INDEX

SRATS U.S. Navy developments in crashworthy seat:	ıng	Review of large low speed wind tunnel required for STOL testing	uirements
SENSORY PERCEPTION	A79-33623	Review lecture on transport aircraft. Con	N79-22999 acepts,
Motion and force cueing requirements and techniques for advanced tactical aircraft simulation	ŧ	Takeoff and landing ground rules	N79-23000
[AD-A064691] SERVICE LIFE	N79-23102	STOL Technology, volume 2	N79-23001
Prospects of using wedge-shaped models for investigating thermal fatigue of turbine	blades	[VKI-LECTURE-SERIES-60-VOL-2] Plight dynamics problems with STOL operat.	N79-23002
Fatigue of helicopters: Service life evaluation	A79-32825	The aerodynamics and performance character of direct lift schemes	N79-23003
SERVOCONTROL	N79-23079	Engine integration and noise consideration	N79-23004 as for
A flyable suspended model helicopter for the investigation of the human pilot behavior		STOL alroraft	N79-23005
SERVOMECHANISMS	A79-35923	Aerodynamics and performance characterist: wing lift augmentation schemes	
Dynamic behaviour and control of single-sha closed-cycle gas turbines	aft	Special Ground testing facilities and tes	N79-23006
SHEAD PLOW	N79-22095	techniques for STOL aircraft	N79-23007
The effect of blockage in shear flow in the	e wind	SHROUDED TURBINES	
tunnel [BU-221]	N79-23125	Damping capacity of paired shrouded turbing in relation to shroud contact condition:	5
SHEAR STRENGTH Optimization of wing structures to satisfy		SIGHAL DETECTORS	A79-32827
strength and frequency requirements	a79-35717	Applicability of fiber optics to aircraft detection systems	fire
SHOCK ABSORBERS		[AD-A063974] SIGNAL HEASUREMENT	N79-22882
Designing aircraft shock absorbers	A79-32585	The measurement of RF-pulse phase and amp	litude in
SHOCK LAYERS Hypersonic viscous shock layer on infinite-	-span	the landing system DLS	A79-34608
arrow wings at angle of attack	_	SIGNAL PROCESSING	
SHOCK TUBES	A79-35158	Correlation-extremal direction finding of and point sources of electromagnetic os	
Wind-tunnel shock-tube simulation and evaluof blast effects on an engine inlet	lation	Modernization of the low speed wind tunne	
[AD-A065388] SHOCK WAYE INTERACTION	N79-23092	Breguet de Velizy: Measuring system mode	
Shock boundary layer interaction on high to transonic turbine cascades		[AAAF-NT-78-12] SIGNAL REFLECTION	N79-23122
Shock-boundary layer interaction in compressing cascades: A review of available data	A79-32342 ssor	Study of RADC newport antenna test range: of reflection reductions and increased coverage	
SHOCK WAVE PROPAGATION	N79-23428	[AD-A065151] SILICON BITRIDES	N79-23331
Surge-induced structural loads in gas turb		Design, fabrication, and evaluation of GA	
[ASME PAPER 79-GT-91] On some methods for the numerical simulation	A79-32368	(trade name) ceramic-wrought alloy atta- concepts for gas turbine engines	chment
flows with complex structure		[AD-A064597] SKIH (STRUCTURAL BEMBER)	N79-22102
Investigation of the regimes of flow past		Gust spectrum fatigue crack propagation is candidate skin materials	ם
upper surfaces of delta wings with shock separated from the leading edges	Waves		A79-33201
SHOCK WAVES	A79-35110	SKIRTS Test plan for a one-half scale laboratory	model of
Low-turbulence high-speed wind tunnel for	the	a rigid skirt hold-down system	N79-23115
determination of cascade shock losses [ASME PAPER 79-GT-129]	A79-32398	[AD-A065171] SLENDER BODIES	
Jet noise: A status report jet mixing shock noise studies		Prediction of aerodynamic characteristics slender bodies alone and with lifting s	
SHORT HAUL AIRCRAFT	N79-23379	to high angles of attack	N79-22023
Quieter short and medium haul aircraft	A79-34921	SLENDER WINGS On slender wings with leading edge camber	
Pour jets for short-haul work Ble 146	A79-34922	SLIDING PRICTION	N79-22032
An analysis of short haul air passenger der volume 2		Effect of friction on motion of a piston combustion products	
[NASA-CR-152157] SHORT TAKROFF AIRCRAFT	N79-22063	SLOTS	A79-35656
Identification of a STOL propulsion plant of from flight data	model	Account of film turbulence for predicting cooling effectiveness in gas turbine co	
Evaluation of composite wing for XFV-12A a:	A79-34521 irplane,	[ASME PAPER 79-GT-200] SLOTTED WIND TUNNELS	A79-32457
appendix C [AD-A063848]	₹79-22215	Effect of the model vertical position in wall wind tunnel	
STOL technology, volume 1 [VRI-LECTURE-SERIES-60-VOL-1]	N79-22996	[AAAF-NT-78-05] SMALL PERTURBATION PLOW The prediction of steady, circumferential	N79-23119
Airworthiness and certification aspects of aircraft for STOL	N79-22997	and temperature distortions in multista flow compressors	
Wind tunnel corrections for STOL models	N79-22998	[ASME PAPER 79-GT-184]	A79-32443

SUBJECT INDEX SUBSORIC PLOW

SHOKE		STEALE GAGES	
Effect of primary-zone equivalence ratio of pollutant formation	0	On the status of experimental stress analys: parachute canopies	ıs of
[NASA-TP-1463]	N79-23086		A79-33646
SOOT Pormation of sooty particles in combustion		STRAPDOWN IMENTIAL GUIDANCE Error model verification for a three axis 1:	200
chambers with series injection of air in	to the	gyro strapdown inertial measurement unit	1561
combustion zone	.70 3:550		N79-22072
SOURD PIELDS	A79-34550	STRESS ANALYSIS Priction damping of resonant stresses in gas	=
Procedure for noise prediction and optimize	ation of	turbine engine airfoils	•
advanced technology propellers	N79-22100		A79-32384
[NASA-CR-3080] SOUND PRESSURE	873-22100	Improving turbine efficiency aerodynamic stress analyses for gas turbine engines	C and
Aerodynamic noise theory lighthill met!		[ASME PAPER 79-GT-176]	A79-32436
turbulent flow, sound pressure, and wave	equations N79-23378	On the status of experimental stress analys: parachute canopies	is of
SPACE BASES		•	A79-33646
Global services systems - Space communicati	LOD A79-34761	STRESS MEASUREMENT	a of
[AIAA 79-0946] SPACECRAFT MODELS	A13-34701	On the status of experimental stress analys: parachute canopies	15 01
An exploratory investigation of quasi-free			A79-33646
models in a supersonic short-duration will	A79-35925	STROUBAL NUMBER Peak Stroubal frequency of subsonic jet noi:	se as a
SPACECRAFT PROPULSION		function of Reynolds number	
Identification of a STOL propulsion plant of from flight data	nodel	STRUCTURAL ANALYSIS	A79-34537
110m 111gut data	A79-34521	A computational scheme for structural influ	ence
SPIN	_	coefficients of certain planar wings	70 30503
Forebody/wing vortex interactions and their influence on departure and spin resistance.		Failures in adhesively bonded structures	A79-34597
-	N79-22001	1	N79-23454
SPIN STABILIZATION The application of spanwise blowing for his	ah angle	STRUCTURAL DESIGN Design and testing of two supercritical com	nressor
of attack spin recovery		cascades	Pressor
CDOTTENC	N79-22004		A79-32330
SPOILERS Low-speed wind-tunnel parametric investigat	tion of	A new high product rate 10 nanosecond, 256 period of correlator for weapon system applicat.	
flight spoilers as trailing-vortex-allev		and fluid mechanics research	
devices on a transport aircraft model [NASA-TP-1419]	N79-22038	Optimization of wing structures to satisfy	A79-34305
An investigation into the transient aerody	namıcs	strength and frequency requirements	
<pre>associated with a spciler emerging into a uniform airstream</pre>	3	Design problems of small turbomachinery	A79-35717
[BU-219]	N79-23046		N79-22097
SPRINGS (FLASTIC) Design and development of a motion compensation	tor for	Calculation and design of closed cycle heli- turbines for high temperature reactors	10
the RSRA main rotor control	reor ror		N79-22098
CMARTTER DEDTERMINE	N79-22541	The design of models and their supports, the	
STABILITY DEBIVATIVES Aerodynamic and aeroelastic characteristics	of	clean-flow tunnel. A review of some of the various proposals the design of high	ne
oscillating loaded cascades at low Mach I	oumber.	Reynolds number, transonic wind tunnels	
I - Pressure distribution, forces, and mo [ASME PAPER 79-GT-111]	A79-32386	STRUCTURAL DESIGN CRITERIA	N79-23110
STATOR BLADES		The effects of design and operating variable	
Unsteady upstream effects in axial-flow sup compressor stages	personic	the response of an axial flow fan to inle- distortions	t flow
[ASHE PAPER 79-GT-55]	A79-32350		N79-22087
The time-variant aerodynamic response of a		STRUCTURAL INPLUBNCE CORPPICIENTS	
row including the effects of airfoil camb [ASME PAPER 79-GT-110]	A79-32385	A computational scheme for structural influ- coefficients of certain planar wings	ence
STATORS			A79-34597
Measurement of heat-transfer rate to a gas stator	turbine	STRUCTURAL STABILITY Study of compressor aeroelastic instabilitie	es in a
[ASME PAPER 78-GT-119]	A79-32935	linear cascade wind tunnel	
STRADY PLOW	1 n		A79-32296
Notes concerning testing time requirements steady and unsteady measurements	111	Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach n	
	N79-23112	[ASME PAPER 79-GT-112]	A79-32387
STERLS An evaluation of coatings for steel and tit	tanıum	Some observations on the local instability of orthotropic structural sections	ot
alloy fasteners for aircraft applications	S		A79-33461
STRERING	N79-23242	STRUCTURAL VIBRATION Forced vibrations of a single stage axial	
Peasibility demonstration of a vertical see	eking	compressor rotor	
seat steering system	370 33640		A79-32383
STEREOSCOPT	A79-33614	The time-variant aerodynamic response of a row including the effects of airfoil cambo	
Parametric analysis of stereometric tracker	for	[ASHE PAPER 79-GT-110]	A79-32385
use in tactical aircraft [AD-A064688]	N79-22086	SUBSONIC AIRCRAPT Propulsion system considerations for the sul	hsonic
STOCHASTIC PROCESSES		V/STOL	
Nonlinear stochastic control design for gas turbine engines	5	[ASME PAPER 78-GT-57] SUBSONIC PLOW	A79-32934
[AD-A065075]	N79-22103	Peak Strouhal frequency of subsonic jet noi:	se as a
STORAGE STABILITY		function of Reynolds number	
Preventing fires in airport fuel systems	A79-34923	A finite element approach to subsonic aerod	179-34537 Ynamics
	•		A79-35777

SUBSORIC FLUTTER SUBJECT INDEX

SUBSOBIC FLUTTEE		SURFACE PINISHING	
Effect of interblade phase angle and incident	dence	The nature of adhesion mechanisms and the	
angle on cascade pitching stability [ASME PAPER 79-GT-153]	A79-32418	<pre>influence of surface treatments on the b of bonded joints</pre>	enaviour
SUCTION	273 32113	or source jernes	N79-23455
Performance of a vortex-controlled diffus		SURPACE GEOMETRY	
annular swirl-can combustor at inlet Mac numbers up to 0.53	Cn	Three-dimensional lifting-surface theory for annular blade row	or an
[NASA-TP-1452]	N79-22099	[ASME PAPER 79-GT-182]	A79-32441
SUPERCRITICAL PLOW		Numerical representation of aircraft geome	
Computer-aided design - Aerodynamıcs	A79-33456	SURPACE LAYERS	A79-32588
SUPERPLASTICITY		Radiation field of a conformal phased array	
Concurrent superplastic forming/diffusion	bonding	rotational-polarization elements situated	dona
of B-1 components	N79-23251	surface of revolution	A79-32734
Fabrication of titanium at high temperatur	res	SURFACE ROUGHNESS EFFECTS	
SUPERSONIC AIRCRAFT	N79-23252	The influence of the blading surface rough the aerodynamic behavior and characterist	
High angle of incidence implications upon	aır	an axial compressor	.10 01
intake design and location for superson:	ic cruise	[ASME PAPER 79-GT-102]	A79-32378
aircraft and highly maneuverable transon aircraft	urc	SURPACE VEHICLES CFR Vehicle design and performance object:	ves
	N79-22026	Crash Fire Rescue	
Surface pressure data for a supersonic-cri		CHRCRC	179-33612
airplane configuration at Mach numbers of 2.96, 3.30	01 2.30,	SURGES Surge-induced structural loads in gas turb:	ınes
[NASA-TM-80061]	N79-22051	[ASME PAPER 79-GT-91]	A79-32368
SUPERSONIC BOUNDARY LAYERS		SURVIVAL EQUIPMENT An overview of the U.S. Navy Maximum Perform	
The flow past a supersonic trailing edge : transonic turbine cascades	Lu	Frection System	Mance
	A79-32670		A79-33613
SUPERSONIC COMPRESSORS Design and testing of two supercritical co	omntessor	Inflatable survival systems for helicopter:	s A79-33624
cascades	om pressor	Test and evaluation of modified high perform	
[ASME PAPER 79-GT-11]	A79-32330	jet alcorew life preserver	***************************************
SUPERSORIC FLOW Time-variant aerodynamics of oscillating a	airfoıl	[AD-A063959] SWEEP EFFECT	N79-22067
surfaces in a supersonic flowfield		The influence of sweep on the aerodynamic 1	
The generation, radiation and prediction of	A79-34531	of an oscillating NACA 0012 airfoil. Vol Technical report	lume 1:
supersonic jet noise. Volume 2, appendi		[NASA-CR-3092]	N79-22052
Computer program listing		SWEPT WIEGS	_
[AD-A064685] The confluence of two supersonic jets at t	N79-22854 the	Strake-induced separation from the leading of wings of moderate sweep	eages
trailing edge of transonic turbine blade	es	00 11190 01 1011 <u>0</u>	N79-22002
SUPERSONIC PLUTTER	N79-23426	Vortex pattern developing on the upper surman swept wing at high angle of attack	face of
An analysis of aeroengine fan flutter usin	ng twin	a swept wing at migh angle of attack	N79-22007
orthogonal vibration modes	120 20205	Subcritical drag minimization for highly su	ept
[ASME PAPER 79-GT-126] SUPERSONIC TRANSPORTS	A79-32395	wings with leading edge vortices	N79-22021
Aerodynamic design and analysis of the AST		Aerodynamic characteristics of the close-co	oupled
supersonic transport configuration conce [NASA-CR-159051]	ept N79-22046	canard as applied to low-to-moderate swep	o t
SUPERSONIC TURBINES	N 73-22040	wings. Volume 1: General trends [AD-A063819]	N79-22057
Shock boundary layer interaction on high t	turning	SYMBOLIC PROGRAMMING	
transonic turbine cascades	A79-32342	Computer formulations of aircraft models for simulation studies	or
The flow past a supersonic trailing edge i		[NASA-TP-1470]	N79-23008
transonic turbine cascades	170 22670	SYSTEM EPPECTIVENESS	
The flow through low cambered transonic to	A79-32670 urbine	Measuring and improving ATC capacity	A79-33024
cascade		Factors in evaluating the effectiveness of	
SUPERSONIC WIND TUNNELS	N79-22089	collision avoidance logic	A79-33607
Low-turbulence high-speed wind tunnel for	the	CFR Vehicle design and performance objective	
determination of cascade shock losses		Crash Fire Rescue	
[ASME PAPER 79-GT-129] An exploratory investigation of quasi-free	A79-32398	Death by misadventure helicopter escape	A79-33612
models in a supersonic short-duration wi		proposals	1
SUPPORTS	A79-35925	SYSTEMS ABALYSIS	179-33640
Elastomer mounted rotors - An alternative	for	Systems approach to life~cycle design of	
smoother running turbcmachinery		pavements. Volume 3: LIFE2 program list	
[ASME PAPPE 79-GT-149] SURPACE DEFECTS	A79-32414	[AD-A064698] SYSTEMS ENGINEERING	N79-23260
The effect of surface imperfections on the		Omega - Global navigating by VLF fix	
aerodynamic performance of an airfoil at	ŧ		A79-32722
moderate Reynolds numbers [BU-217]	N79-23048	The predesign phase of the second-generation comprehensive helicopter analysis system	00
SURFACE DISTORTION		[AD-A063921]	N79-22082
Effect of number of probes and their ories on the calculation of several compressor		National airport system plan 1978 - 1987	N79-23060
distortion descriptors	400	Hydraulic compressor for a wind tunnel	m/3-23000
[NASA-IM-72859]	N79-23087		N79-23107

SUBJECT INDEX TITAMIUM ALLOIS

SYSTEMS STABILITY	lango	THERBAL CYCLING TESTS	
Effect of interblade phase angle and incide angle on cascade pitching stability	ience	Prospects of using wedge-shaped models for investigating thermal fatigue of turbine	blades
[ASHE PAPER 79-GT-153]	A79-32418		A79-32825
~		THERMAL PATIGUE	
		Prospects of using wedge-shaped models for investigating thermal fatigue of turbine	tlades
T-33 AIRCRAFT			A79-32825
Buffeting measurements in flight and in a tunnel T-33 aircraft	wind	THERMODINANIC CYCLES	
[AAAF-NT-78-17]	N79-23104	Closed Cycle Gas Turbines [VKI-LECTURE-SERIES-24]	N79-22093
TACAB		Closed power cycles' analysis	
Motion and force cueing requirements and techniques for advanced tactical aircraf	÷ 6.	Hydraulic compressor for a wind tunnel	N79-22094
simulation		nydraulic compressor for a wind tunner	N79-23107
[AD-A064691]	N79-23102	THERMODYBANIC SPPICIENCY	
TAIL ASSEMBLIES Highly survivable truss tail boom		A low cost, on-site performance monitoring thermodynamics of shaft power gas to	
[AD-A064181]	N79-22079	[ASNE PAPER 79-GT-21]	A79-32334
TAKEOFF		THERMODYNAMICS	
Takeoff and landing ground rules	N79-23001	Thermodynamics of organic compounds [AD-A065664]	N79-23232
TARGET RECOGNITION		THICK WALLS	
Analysis of visual detection performance: 1978 experiment	Fall	Development of a viscous vortex/wing intera	
[AD-A065118]	N79-23061	program for thick wings with bounded lead [AD-A065181]	N79-23020
TECHNOLOGICAL PORECASTING		THIR WALLED SHELLS	
Ejection systems in the year 2000	A79-33622	Cost-effective production of flight vehicle by the pressure and flow-pressure process	
Advanced nuclear systems for large aircraf		[DGLR PAPER 79-008]	A79-32305
[AIAA 79-0852]	A79-33835	THREE DIMENSIONAL FLOW	
Global services systems - Space communicat [AIAA 79-0946]	A79-34761	An application of 3-D viscous flow analysis design of a low-aspect-ratio turbine	s to the
Demand for large freighter aircraft as pro		[ASME PAPER 79-GT-53]	A79-32348
by the NASA cargo/logistics airlift syst [NASA-TM-80074]	em studies N79-22061	Three-dimensional lifting-surface theory for annular blade row	or an
TECHNOLOGY ASSESSMENT	117 22001	[ASME PAPER 79-GT-182]	A79-32441
Analyzing technology potential for strateg		Parameters of three-dimensional flow past	
[AIAA 79-0841] Technology requirements and readiness for	A79-33828 Very	near the free surface of a ponderable fl	A79-35155
large vehicles		Axial flow turbines flow relations and	equations
[AIAA 79-0851] STOL technology, volume 1	A79-33834	THROTTLING	N79-22092
[VKI-LECTURE-SERIES-60-VCL-1]	N79-22996	The role of the backside parameter in heigh	
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSPER		The role of the backside parameter in heig	at control A79-34522
[VKI-LECTURE-SERIES-60-VCL-1]			
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRANSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATIOE	er 5	The role of the backside parameter in height THRUST	∆79-34522 s
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles	er 5	THRUST A special extension of the General Point Performance Equation for flight path:	A79-34522
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, number [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for	er 5 N79-23885 A79-33831	THRUST A special extension of the General Point Performance Equation for flight path: THRUST BEARINGS Operating characteristics of a cantilever-	A79-34522 5 A79-35926 sounted
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agri	er 5 N79-23885 A79-33831	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARIEGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear:	A79-34522 S A79-35926 Bounted
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, number [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for	er 5 N79-23885 A79-33831	THRUST A special extension of the General Point Performance Equation for flight path: THRUST BEARINGS Operating characteristics of a cantilever-	A79-34522 5 A79-35926 sounted
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECORNUMICATION	N79-23885 A79-33831 more culture N79-22076	The role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUREMENT Afterbody tests in the Modane hot gas bench	A79-34522 5 A79-35926 100unted 100 N79-22518
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agri and forestry [NASA-CR-152258]	N79-23885 A79-33831 more culture N79-22076	The role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUREMENT	A79-34522 A79-35926 Bounted Lng R79-22518
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBRUBICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb	N79-23885 A79-33831 more culture N79-22076 100 A79-34761 er 5	The role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUREMENT Afterbody tests in the Modane hot gas bench [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical see	A79-34522 A79-35926 Bounted Lng R79-22518
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, number 10 cm. 10 c	A79-23885 A79-33831 more culture N79-22076 lon A79-34761	The role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST MEASUREMENT Afterbody tests in the Modane hot gas bence [AAAF-NT-78-10] THRUST VECTOR CONTROL	a79-34522 a79-35926 ary-35926 nounted nry-22518 nry-23095
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATIOB Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBRUBICATIOB Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTIOB The prediction of steady, circumferential	A79-33885 A79-33881 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever-resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUBERBHT Afterbody tests in the Modane hot gas bence [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the	A79-34522 A79-35926 Bounted BR79-22518 R79-23095 Eking A79-33614
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agri and forestry [NASA-CR-152258] TELECOMMUNICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistage	A79-33885 A79-33881 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUBERBHT Afterbody tests in the Modane hot gas bence [AAAF-NT-78-10] THBUST VECTOR CONTROL Feasibility demonstration of a vertical see seat steering system	A79-34522 A79-35926 Brounted Broy-22518 A79-23095 Eking A79-33614 Broy-33614
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATIOB Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBRUBICATIOB Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTIOB The prediction of steady, circumferential	A79-33885 A79-33881 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever-resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST HEASUBERBHT Afterbody tests in the Modane hot gas bence [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the	A79-34522 A79-35926 Bounted BR79-22518 R79-23095 Eking A79-33614
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, number 1	A79-33831 MOTE Culture N79-22076 ION A79-34761 er 5 N79-23885 pressure e axial A79-32443 des	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRAKINGS Operating characteristics of a cantilevering characteristics of a cantilevering hash-tp-1438] THRUST BRASORRHENT Afterbody tests in the Modane hot gas bence [AAAF-NT-78-10] THRUST VECTOR CONTROL Peasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for	A79-34522 A79-35926 Brounted Broy-22518 A79-23095 Eking A79-33614 Brust A79-33615
[VKI-LECTURE-SERIES-60-VOL-1] TRCHBOLOGY TRABSFER European scientific notes, volume 32, number 1	A79-33885 A79-33881 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantileveriesticinet-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUBBRENT Afterbody tests in the Modane hot gas benced [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Server	A79-34522 A79-35926 Brounted Broy-22518 A79-23095 Eking A79-33614 Brust A79-33615
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, number 1	A79-33831 MOTE Culture N79-22076 100 A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts -	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilevering characteristics of a cantilevering share produced thrust bears [NASA-TP-1438] THRUST HEMSUREMENT Afterbody tests in the Modane hot gas benced [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Sevential Sections Laboratory (NSSL) [AD-A065943]	A79-34522 A79-35926 Brounted Broy-22518 A79-23095 Eking A79-33614 Brust A79-33615
[VKI-LECTURE-SERIES-60-VOL-1] TRCHBOLOGY TRABSPER European scientific notes, volume 32, number 100-1057 [AD-A065400] TRCHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TRLECOMMUNICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, number 100-1065400] TRHPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistage flow compressors [ASME PAPER 79-GT-184] Introduction to cooling of gas turbine that TRHPERATURE EFFECTS Thermal influences in gas turbine transient Effects of changes in compressor charact	A79-33831 more culture N79-22076 ion A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever-i resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUBERBRY Afterbody tests in the Modane hot gas bence [AAAP-NT-78-10] THRUST VECTOR CONTROL Peasibility demonstration of a vertical see seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential DRPRNDENCE	A79-34522 A79-35926 Bounted R79-22518 R79-23095 Eking A79-33614 LUST A79-33615 Ere R79-23604
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSFER European scientific notes, volume 32, number 1	A79-33831 MOTE Culture N79-22076 100 A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts -	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilevering characteristics of a cantilevering share produced thrust bears [NASA-TP-1438] THRUST HEMSUREMENT Afterbody tests in the Modane hot gas benced [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Sevential Sections Laboratory (NSSL) [AD-A065943]	A79-34522 A79-35926 Bounted BR79-22518 A79-23095 Exing A79-33614 BR79-33615 EFFE BR79-23604 BRT9-23604
[VKI-LECTURE-SERIES-60-VOL-1] TRCHBOLOGY TRABSPER European scientific notes, volume 32, number 1	A79-33831 MOTE Culture N79-22076 100 A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever-i resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUREMENT Afterbody tests in the Modane hot gas benced [AAAP-NT-78-10] THRUST VECTOR CONTROL Peasibility demonstration of a vertical seed seed steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential	A79-34522 A79-35926 Bounted R79-22518 R79-23095 Eking A79-33614 LUST A79-33615 Ere R79-23604 Antheritant State Stat
[VKI-LECTURE-SERIES-60-VOL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, number 1	A79-33831 MOTE Culture N79-22076 100 A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409	THE role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST MEASUREMENT Afterbody tests in the Modane hot gas bence [AAAP-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical second seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Second S	A79-34522 A79-35926 Bounted BR79-22518 A79-23095 Exing A79-33614 BR79-33615 EFFE BR79-23604 BRT9-23604
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY THABSPER European scientific notes, volume 32, number 1	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantileverinestlient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUREMENT Afterbody tests in the Modane hot gas bench [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Section Seat Storms Laboratory (NSSL) [AD-A065943] TIME DEPENDENCE Characteristic time correlations of pollutations from an annular gas turbine consistency of the Section Seat Seat Section Seat Section Seat Section Seat Seat Section Section Seat Seat Seat Seat Section Seat Section Seat Section Seat Seat Seat	A79-34522 A79-35926 Bounted B79-22518 A79-23095 Eking A79-33614 Brust A79-33615 Ere Br9-23604 A79-32452
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBRUBICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistag flow compressors [ASME PAPER 79-GT-184] Introduction to cooling of gas turbine that TEMPERATURE EFFECTS Thermal influences in gas turbine transien Effects of changes in compressor charact [ASME PAPER 79-GT-143] TEST RQUIPMENT Aerodynamic effects simulator for test aircraft escape systems TEST PACILITIES Special Ground testing facilities and test	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617	THE role of the backside parameter in height THRUST A special extension of the General Point Performance Equation for flight paths THRUST BEARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST MERSUBERBENT Afterbody tests in the Modane hot gas bench [AAAP-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical second seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Second Storms Laboratory (NSSL) [AD-A065943] THE DRPHDBECC Characteristic time correlations of polluta emissions from an annular gas turbine columns of aircraft engines [ASBE PAPER 79-GT-194] TIP SPEED Procedure for noise prediction and optimizated advanced technology propellers	A79-34522 A79-35926 A79-35926 DOUNTED N79-22518 A79-23095 Eking A79-33614 DOUST A79-33615 Ere N79-23604 Anticolor A79-32452 Ation of
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY THABSPER European scientific notes, volume 32, number 1	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantileverinestlient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUREMENT Afterbody tests in the Modane hot gas bench [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical sees seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Section Seat Storms Laboratory (NSSL) [AD-A065943] TIME DEPENDENCE Characteristic time correlations of pollutations from an annular gas turbine consistency of the Section Seat Seat Section Seat Section Seat Section Seat Seat Section Section Seat Seat Seat Seat Section Seat Section Seat Section Seat Seat Seat	A79-34522 A79-35926 Bounted B79-22518 A79-23095 Eking A79-33614 Brust A79-33615 Ere Br9-23604 A79-32452
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBRUBICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistag flow compressors [ASME PAPER 79-GT-184] Introduction to cooling of gas turbine that TEMPERATURE EFFECTS Thermal influences in gas turbine transien Effects of changes in compressor charact [ASME PAPER 79-GT-143] TEST RQUIPMENT Aerodynamic effects simulator for test aircraft escape systems TEST PACILITIES Special Ground testing facilities and test techniques for SICL aircraft	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617 lng N79-23007	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUBEBENT Afterbody tests in the Modane hot gas bence [AAAP-NT-78-10] THBUST VECTOR CONTROL Feasibility demonstration of a vertical see seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORES Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevential Section Laboratory (NSSL) [AD-A065943] THE DRPENDENCE Characteristic time correlations of pollutations for an annular gas turbine collusions from an annular gas turbine collustrations for a controlled ejection and optimizations and advanced technology propellers [NASA-CR-3080] TITARIUM ALLOYS An evaluation of coatings for steel and time	A79-34522 A79-35926 A79-35926 DOUNTED N79-22518 A79-23095 Eking A79-33614 A79-33615 Ere N79-23604 Antibustor A79-32452 Ation of N79-22100
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY THABSPER European scientific notes, volume 32, number 1	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617 lng N79-23007	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantileverine serilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUREMENT Afterbody tests in the Modane hot gas bench [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical series seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevent Storms Laboratory (NSSL) [AD-A065943] TIME DEPENDENCE Characteristic time correlations of pollutations from an annular gas turbine consistency of the Series Series from an annular gas turbine consistency of the Series Series from an annular gas turbine consistency from an annular gas turbine consistency of the Series Series from an annular gas turbine consistency of the Series from an annular gas turbine consistency of the Series from an annular gas turbine consistency of the Series from an annular gas turbine consistency of the Series from the	A79-34522 A79-35926 A79-35926 DOUNTED N79-22518 A79-23095 Eking A79-33614 A79-33615 Ere N79-23604 Antibustor A79-32452 Ation of N79-22100
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBHOWICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistag flow compressors [ASME PAPER 79-GT-184] Introduction to cooling of gas turbine that TEMPERATURE EFFECTS Thermal influences in gas turbine transien Effects of changes in compressor charact [ASME PAPER 79-GT-143] TEST EQUIPMENT Aerodynamic effects simulator for test aircraft escape systems TEST PACILITIES Special Ground testing facilities and test techniques for STCL aircraft TESTING TIBE Notes concerning testing time requirements steady and unsteady measurements	A79-33831 more culture N79-22076 lon A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 lng A79-33617 lng N79-23007	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUBEBENT Afterbody tests in the Modane hot gas bence [AAAP-NT-78-10] THBUST VECTOR CONTROL Feasibility demonstration of a vertical see seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORES Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevents Laboratory (NSSL) [AD-A065943] THE DEPREBENCE Characteristic time correlations of polluta emissions from an annular gas turbine collustrations for aircraft engines [ASEM PAPER 79-GT-194] TIP SPEED Procedure for noise prediction and optimizational advanced technology propellers [NASA-CR-3080] TITARIUM ALLOYS An evaluation of coatings for steel and the alloy fasteners for aircraft applications	A79-34522 A79-35926 Bounted B79-22518 A79-23095 Eking A79-33614 EVE A79-33615 EVE A79-33615 EVE BY9-23604 BY9-23604 BY9-23604 BY9-23604 BY9-23604 BY9-23604 BY9-23604 BY9-23604
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, number 1	A79-33831 Emore Culture N79-22076 Ion A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 ing A79-33617 ing N79-23007 in N79-23112	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantileverinesslient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASURERBENT Afterbody tests in the Modane hot gas benced [AAAF-NT-78-10] THRUST VECTOR CONTROL Feasibility demonstration of a vertical seed seed steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORMS Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevent Storms Laboratory (MSSL) [AD-A065943] TIME DRPENDENCE Characteristic time correlations of pollutate emissions from an annular gas turbine content of the storm of the sto	A79-34522 A79-35926 Bounted B79-22518 A79-23095 Eking A79-33614 B79-33615 EPE B79-23604 AT9-32452 AT9-32452 AT9-32452 AT9-32452 AT9-32452
[VKI-LECTURE-SERIES-60-VCL-1] TECHBOLOGY TRABSPER European scientific notes, volume 32, numb [AD-A065400] TECHBOLOGY UTILIZATION Large lighter-than-air vehicles [AIAA 79-0847] Identification of high payoff research for efficient applicator helicopters in agriand forestry [NASA-CR-152258] TELECOBHOWICATION Global services systems - Space communicat [AIAA 79-0946] European scientific notes, volume 32, numb [AD-A065400] TEMPERATURE DISTRIBUTION The prediction of steady, circumferential and temperature distortions in multistag flow compressors [ASME PAPER 79-GT-184] Introduction to cooling of gas turbine that TEMPERATURE EFFECTS Thermal influences in gas turbine transien Effects of changes in compressor charact [ASME PAPER 79-GT-143] TEST EQUIPMENT Aerodynamic effects simulator for test aircraft escape systems TEST PACILITIES Special Ground testing facilities and test techniques for STCL aircraft TESTING TIBE Notes concerning testing time requirements steady and unsteady measurements	A79-33831 Emore Culture N79-22076 Ion A79-34761 er 5 N79-23885 pressure e axial A79-32443 des N79-22090 ts - eristics A79-32409 ing A79-33617 ing N79-23007 in N79-23112	THRUST A special extension of the General Point Performance Equation for flight paths THRUST BRARINGS Operating characteristics of a cantilever- resilient-pad gas-lubricated thrust bear: [NASA-TP-1438] THRUST BRASUBEBENT Afterbody tests in the Modane hot gas bence [AAAP-NT-78-10] THBUST VECTOR CONTROL Feasibility demonstration of a vertical see seat steering system Vertical-seeking autopilot design of the vector controlled ejection seat THUNDERSTORES Thunderstorm turbulence investigations for 1973-1974 in support of the National Sevents Laboratory (NSSL) [AD-A065943] THE DEPREBENCE Characteristic time correlations of polluta emissions from an annular gas turbine collustrations for aircraft engines [ASEM PAPER 79-GT-194] TIP SPEED Procedure for noise prediction and optimizational advanced technology propellers [NASA-CR-3080] TITARIUM ALLOYS An evaluation of coatings for steel and the alloy fasteners for aircraft applications	A79-34522 A79-35926 Bounted B79-22518 A79-23095 Eking A79-33614 BA79-33615 Ere BY79-23604 Boustor A79-32452 Botton of BY79-22100 Banus BY79-23242 BONGS BY79-23242 BY79-2351

TOLERANCES (BECHANICS) SUBJECT INDEX

TOLBRANCES (HECHANICS) An integrated fault-tolerant avionics syst	.em	Calibration of the AEDC-PWT 16-foot transo tunnel aerodynamic test section at vario	
concept for advanced aircraft [AD-A065136]	N79-23082	Reynolds numbers [AD-A065112]	N79-22117
TOOLING		Large transonic wind tunnels	N70-22106
Composites tooling speeds fabrication - Fin labor cost cut sharply	ergy,	[VKI-LECTURE-SERIES-52] The injector driven tunnel	N79-23105
TRACKING NETWORKS	A79-33587	Bydraulic compressor for a wind tunnel	N79-23106
Radio-engineering tracking systems	170 25504		N79-23107
TRAILING EDGES	A79-35501	The priming of a wind tunnel with a hydrau compressor	110
The flow past a supersonic trailing edge i	n	·	N79-23108
transonic turbine cascades	A79-32670	The design of models and their supports, t clean-flow tunnel. A review of some of	
The confluence of two supersonic jets at t	he	various proposals the design of high	
trailing edge of transonic turbine blade	n79-23426	Reynolds number, transonic wind tunnels	N79-23110
TRAINING SIMULATORS		Experimental studies in a Ludwieg tube tra	
Simulators cutting the fuel bill revie airline, military, general aviation and		tunnel	N79-23111
trainers	501160	Wall interference effects	
Now toghnology Cf 1N completor	A79-32750	Bureness Arangeria used tunnel project for	N79-23113
New technology S61N simulator	A79-33458	European transonic wind tunnel project for Reynolds numbers cryogenic proposal	nign
TRAJECTORY MEASUREMENT		[AAAF-NT-78-01]	N79-23118
Comparison of store trajectory and aerodyn loads, and model flow-field characterist		Improvements on the C4/Vernon wind tunnel transonic operation	- - -
obtained in the AEDC PWT/4T and VFK/A wi		[AAAF-NT-78-13]	N79-23123
tunnels at Mach number 1.63 [AD-A065137]	N79-23017	Construction problems specific to models f Reynolds number wind tunnels scale m	
TRANSIENT RESPONSE	M73-23017	[AAAF-NT-78-02]	N79-23124
Thermal influences in gas turbine transien Effects of changes in compressor charact		TRANSPARENCE Aerospace Transparent Materials and Enclos	nroe
[ASME PAPER 79-GT-143]	A79-32409	(12th)	dres
TRANSMISSION		[AD-A065049]	N79-23066
Advanced coupling development program [AD-A064296]	N79-22522	Helicopter transparent enclosures. Volume general specification	2: A
User's manual for steady state and transie		[AD-A065462]	N79-23067
thermal analysis of a shaft-bearing syst (SHABERTH)	еш	TRANSPORT AIRCRAFT Very Large Vehicle Conference, Arlington,	Va.,
[AD-A064150]	N79-22523	April 26, 27, 1979, Technical Papers	
TRAFSMISSIONS (MACHINE ELEMENTS) Design and development of a motion compens	ator for	Analyzing technology potential for strateg	A79-33827
the RSRA main rotor control		[AIAA 79-0841]	A79-33828
TRANSONIC COMPRESSORS	N79-22541	Large wing-in-ground effect transport airc [AIAA 79-0845]	raft A79-33830
An off-design correlation of part span dam	per	Large lighter-than-air vehicles	
losses through transcnic axial fan rotor [ASME PAPER 79-GT-6]	s A79-32329	[AIAA 79-0847] Concept for a large multi-mission amphibia	A79-33831
Unsteady upstream effects in axial-flow su		[AIAA 79-0849]	A79-33832
compressor stages	170-22250	Strategic airlift vehicle concepts	A79-33833
[ASME PAPER 79-GT-55] TRANSONIC PLOW	A79-32350	[AIAA 79-0850] Technology requirements and readiness for	
The flow past a supersonic trailing edge i	n.	large vehicles	A79-33834
transonic turbine cascades	A79-32670	[AIAA 79-0851] Behavior of a transport aircraft with a hi	
Some experimental results connected with t	he	aspect ratio wing at a high angle of inc	
transonic instabilities on an airfoil	A79-32671	Low-speed wind-tunnel investigation of a	N79-22005
The flow through low cambered transonic tu		large-scale VTOL lift-fan transport mode	
cascade	N79-22089	[NASA-TM-78560] Low-speed wind-tunnel parametric investiga	N79-22035
Computer program to calculate three-dimens	nonal	flight spoilers as trailing-vortex-allev	
boundary layer flows over wings with wal transfer	l mass	devices on a transport aircraft model [NASA-TP-1419]	N79-22038
[NASA-CR-3123]	N79-23016	Demand for large freighter aircraft as pro	jected
User guide for STRMIN: A boundary-layer p for contoured wind-tunnel liner design	rogram	<pre>by the NASA cargo/logistics airlift syst [NASA-TM-80074]</pre>	em studies N79-22061
[NASA-CR-159058]	N79-23114	Review lecture on transport aircraft. Con	
Improvements on the C4/Vernon wind tunnel		utilization and prospects	N79-23000
transonic operation [AAAF-NT-78-13]	N79-23123	Plight dynamics problems with STOL operati	
Transonic flows in turbomachinery. Volume		•	N79-23003
Theory, part 2 [VKI-LECTURE-SERIES-59-1-PT-2]	N79-23425	TRANSVERSE OSCILLATION Response of plate to nonstationary random	load
The confluence of two supersonic jets at t	.he		A79-34604
trailing edge of transonic turbine blade	s N79-23426	TRUSSES Highly survivable truss tail boom	
TRANSONIC WIND TUNNELS		[AD-A064181]	N79-22079
Implementation of unsteady oscillatory flo transonic wind turnel	ws in a	TURBINE BLADES Shock boundary layer interaction on high t	n rh ına
	A79-32290	transonic turbine cascades	
Low-turbulence high-speed wind tunnel for determination of cascade shock losses	the	Measurements of heat transfer in circular,	A79-32342
[ASME PAPER 79-GT-129]	A79-32398	rectangular and triangular ducts, repres	
		typical turbine blade internal cooling pusing transient techniques	assages
		[ASME PAPER 79-GT-40]	A79-32343

SUBJECT INDEX TURBOPROP ENGINES

A general solution for distorted flows in cascades	Optimization for rotor blades of tandem design for
of aerofoils	axial flow compressors
[ASHE PAPEE 79-GT-65] A79-32353	[ASME PAPER 79-GT-125] A79-32394
An experimental study of endwall and airfoil	The prediction of steady, circumferential pressure
surface heat transfer in a large scale turbine	and temperature distortions in multistage axial
tlade cascade	flow compressors
[ASME PAPER 79-GT-99] A79-32375	[ASME PAPER 79-GT-184] A79-32443
Priction damping of resonant stresses in gas	Wind tunnel model study of the hot exhaust plume
turbine engine airfoils	from the compressor research facility at
[ASME PAPER 79-GT-109] A79-32384	Wright-Patterson Air Force Base, Ohio
Performance estimation of partial admission turbines	[ASHE PAPER 79-GT-186] A79-32445
[ASHE PAPER 79-GT-123] A79-32392	Selected problems concerning unstable operation of
A design review of ceramic components for turbine	alroraft turbine engine compressors
engines [ASME PAPEE 79-GT-183] A79-32442	A79-32589
	Preliminary studies using photon correlation
Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine	velocimetry in turbomachinery and combustion systems
blades prepared from Namonic 80A	A79-34314
A79-32586	TURBOPAN AIRCRAPT
Numerical analysis of flow through turbine	Quieter short and medium haul aircraft
cascades by the Modified FLIC Method	A79-34921
179-32590	TURBOPAN BHGINES
Prospects of using wedge-shaped models for	An analysis of aeroengine fan flutter using twin
investigating thermal fatigue of turbine blades	orthogonal vibration modes
179-32825	[ASME PAPER 79-GT-126] A79-32395
Damping capacity of paired shrouded turbine blades	Identification of a STOL propulsion plant model
in relation to shroud contact conditions	from flight data
A79-32827	A79-34521
Evaluation of the aerodynamic damping of the	F101 engine derivative work advances
oscillations of turbine blades with a view to	a79-34600
pitch, stagger angle, and curvature of blades	Quieter short and medium haul aircraft
A79-32828	179-34921
NC equipment spurs blisk manufacture - Full-scale	Nonlinear stochastic control design for gas
production slated Numerical Control for	turbine engines
integrated helicopter compressor blade and disk	[AD-A065075] N79-22103
manufacture	Lo-frequency augmentor instability study
179-33589	[AD-A065144] N79-22104
Introduction to cooling of gas turbine blades	Advanced composite engine rotor design
N79-22090	[AD-A063843] N79-22105
Aerodynamic problems in cooled turbine blading	Lo-frequency augmentor instability investigation
design for small gas turbine N79-22091	computer program user's manual [AD-A065774] N79-23093
Design, fabrication, and evaluation of GATORIZED	TURBOFANS
(trade name) ceramic-wrought alloy attachment	An off-design correlation of part span damper
concepts for gas turbine engines	losses through transonic axial fan rotors
[AD-A064597] N79-22102	[ASME PAPER 79-GT-6] A79-32329
Turbine blades: Erosion and Corrosion. Citations	Advanced composite engine rotor design
from the NTIS data base	[AD-A063843] N79-22105
[NTIS/PS-79/0148/1] N79-22111	TURBOJET ENGINES
Turbine blades: Erosion and Corrosion. Citations	Engine evaluation of a vibration damping treatment
from the Engineering Index data base	for inlet guide vanes
[NTIS/PS-79/0149/9] N79-22112	[ASME PAPER 79-GT-163] A79-32425
The confluence of two supersonic jets at the	Identification and dual adaptive control of a
trailing edge of transonic turbine blades	turbojet engine
n79-23426	[NASA-TM-79145] N79-23257
TURBIBE BUGIBES	TURBONACHINE BLADES
Regression simulation of turbine engine	Aerodynamic and aeroelastic characteristics of oscillating loaded cascades at low Mach number.
performance/aircraft regression model [AD-A063975] N79-22106	
	I - Pressure distribution, forces, and moments
TORBINE WHEELS Aerodynamic design of fixed and warrable geometry	[ASME PAPER 79-GT-111] A79-32386
Aerodynamic design of fixed and variable geometry	Effect of interblade phase angle and incidence
Aerodynamic design of fixed and variable geometry nozzleless turbine casings	Effect of interblade phase angle and incidence angle on cascade pitching stability
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] A79-32364	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHIBERY Elastomer mounted rotors - An alternative for
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPED GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHIBERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBONACHIBERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] A79-32296	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPRE 79-GT-153] A79-32418 TURBORACHIERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPRE 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] A79-32296 An off-design correlation of part span damper	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] A79-32296 An off-design correlation of part span damper losses through transonic axial fan rotors	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A79-32329	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOBACHIEBRY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery Sample calculation 4: Phi = 9 deg 57 N79-22490
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Design and testing of two supercritical compressor	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] A79-32296 An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] A79-32329 Design and testing of two supercritical compressor cascades	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] A79-32296 An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A79-32329 Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] A79-32330	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPRE 79-GT-153] A79-32418 TURBORACHIERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPRE 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPEE 79-GT-11] Unsteady upstream effects in axial-flow supersonic	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-8058959] N79-23094
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] A79-32296 An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A79-32329 Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] A79-32330 Unsteady upstream effects in axial-flow supersonic compressor stages	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23094 Transonic flows in turbomachinery. Volume 1:
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] A79-32364 NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] A79-32296 An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] A79-32329 Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] A79-32330 Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPER 79-GT-55] A79-32350	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-CT-153] A79-32418 TURBOBACHIBERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-AD58959] N79-23094 Transonic flows in turbomachinery. Volume 1:
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPPE 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPPE 79-GT-11] Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPPE 79-GT-55] The influence of the blading surface roughness on	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-8058959] Transonic flows in turbomachinery. Volume 1: Theory, part 2 [VKI-LECTURE-SERIES-59-1-PT-2] N79-23425
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPER 79-GT-55] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHINERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22097 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23490 Transonic flows in turbomachinery. Volume 1: Theory, part 2 [VKI-LECTURE-SERIES-59-1-PT-2] N79-23425 Centrifugal-reciprocating compressor
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPER 79-GT-55] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-CT-153] A79-32418 TURBOBACHIEBRY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23094 Transonic flows in turbomachinery. Volume 1: Theory, part 2 [VKI-LECTURE-SERIES-59-1-PT-2] N79-23425 Centrifugal-reciprocating compressor [NASA-CASE-NPO-14597-1] N79-23431
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPEE GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TP NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPEE 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPEE 79-GT-11] Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPEE 79-GT-55] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor [ASME PAPEE 79-GT-102] A79-32378	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-GT-153] A79-32418 TURBOHACHIBERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23490 Transonic flows in turbomachinery. Volume 1: Theory, part 2 [VKI-LECTURE-SERIES-59-1-PT-2] N79-23425 Centrifugal-reciprocating compressor [NASA-CASE-NPO-14597-1] N79-23431 TURBOPROP ENGINES
Aerodynamic design of fixed and variable geometry nozzleless turbine casings [ASME PAPER GT-87] NC equipment spurs blisk manufacture - Full-scale production slated Numerical Control for integrated helicopter compressor blade and disk manufacture A79-33589 TURBOCOMPRESSORS Study of compressor aeroelastic instabilities in a linear cascade wind tunnel [ONERA, TF NC. 1979-6] An off-design correlation of part span damper losses through transonic axial fan rotors [ASME PAPER 79-GT-6] Design and testing of two supercritical compressor cascades [ASME PAPER 79-GT-11] Unsteady upstream effects in axial-flow supersonic compressor stages [ASME PAPER 79-GT-55] The influence of the blading surface roughness on the aerodynamic behavior and characteristic of an axial compressor	Effect of interblade phase angle and incidence angle on cascade pitching stability [ASME PAPER 79-CT-153] A79-32418 TURBOBACHIBERY Elastomer mounted rotors - An alternative for smoother running turbomachinery [ASME PAPER 79-GT-149] A79-32414 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [NASA-CR-158522] N79-22087 Design problems of small turbomachinery N79-22087 Sample calculation 4: Phi = 9 deg 57 The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions [AD-A058959] N79-23094 Transonic flows in turbomachinery. Volume 1: Theory, part 2 [YKI-LECTURE-SERIES-59-1-PT-2] N79-23425 Centrifugal-reciprocating compressor [NASA-CASE-NPO-14597-1] N79-23431

TURBOSHAFTS SUBJECT INDEX

TURBOSHAFTS		Unsteady upstream effects in axial-flow supersonic
Dynamic behaviour and control of single-sha	aft	compressor stages
closed-cycle gas turbines		[ASME PAPER 79-GT-55] A79-32350
n	N79-22095	Notes concerning testing time requirements in
Design problems of small turbomachinery	×70 22007	steady and unsteady measurements
Performance estimation for a highly loaded	N79-22097	USER MANUALS (COMPUTER PROGRAMS) N79-23112
eight-blade propeller combined with an ac		User's guide to data preparation: Photogrammetric
technology turboshaft engine	avancea	navigation analysis program Potonap
[NASA-TM-80075]	N79-22101	[AD-A064614] N79-22070
Assessment of augmented electronic fuel con		User's manual for steady state and transient
for modular engine diagnostics and condi-		thermal analysis of a shaft-bearing system
monitoring		(SHABERTH)
[AD-A065128]	N79-23091	[AD-A064150] N79-22523
TURBULENCE		UTILIZATION
Improvement of the aerodynamic circuit in	the	An assessment of national risk: General concepts
Breguet-Velizy low speed wind tunnel		and overall approach carbon fiber
[AAAF-NT-78-11]	N79-23121	utilization in commercial aviation
TURBULENCE EFFECTS	c. 1	N79-22208
Account of film turbulence for predicting i		\/
cooling effectiveness in gas turbine com [ASME PAPER 79-GT-200]	A79-32457	V
Lifting surface approach to the estimation		V/STOL AIRCRAFT
response of finite wings	or gast	Propulsion system considerations for the subsonic
	A79-34596	V/STOL
Effects of turbulence on laminar separation		[ASME PAPER 78-GT-57] A79-32934
aerodynamic surfaces such as airfoils and		VARIABLE CYCLE BUGINES
compressor blading		Variable cycle engine technology program planning
[NASA-CR-158488]	N79-22036	and definition study
The effect of surface imperfections on the		[NASA-CR-159539] N79-23084
aerodynamic performance of an airfoil at		Analytical derivatives
moderate Reynolds numbers		[AD-A064944] N79-23090
[BU-217]	N79-23048	VARIABLE GROMETEY STRUCTURES
TURBULENT FLOW Effects of flow turbulence and noise on		Aerodynamic design of fixed and variable geometry
aerodynamic phenomena and measured quanti	1+100	nozzleless turbine casings [ASMY PAPER GT-87] A79-32364
wind tunnel tests and boundary layer	LCIES	[ASME PAPER GT-87] A79-32364 WELOCITY MEASUREMENT
transition		Preliminary studies using photon correlation
	N79-23109	velocimetry in turbomachinery and combustion
Aerodynamic noise theory lighthill meth		systems
turbulent flow, sound pressure, and wave		A79-34314
	N79-23378	VERTICAL MOTION
TURBULENT JETS		Feasibility demonstration of a vertical seeking
Asymmetry of a circular jet observed in nea		seat steering system
far fields low Re turbulence and acou	ustic	179-33614
characteristics	170 20520	Vertical-seeking autopilot design of thrust
TURBULENT HIXING	A79-34539	vector controlled ejection seat A79-33615
Jet noise: A status report jet mixing	5 n c	VERTICAL TAKEOPP AIRCRAFT
shock noise studies	anu	Low-speed wind-tunnel investigation of a
5	N79-23379	large-scale VTOL lift-fan transport model
TURBULENT WARES		[NASA-TM-78560] N79-22035
Preliminary studies using photon correlation	on	Evaluation of composite wing for XFV-12A airplane,
velocimetry in turbomachinery and combust	tion	appendix C
systems		[AD-A063848] N79-22215
	A79-34314	VERY HIGH PREQUENCIES
TWO DIMENSIONAL PLOW		Experimental analysis of V.H.F. antennas for
Two dimensional anemometric probe two		helicopter homing systems using scale-model
dimensional flow. Wind tunnel tests	N70 03446	techniques
[AAAF-NT-78-09]	N79-23116	A79-34392
11		VERY LOW PREQUENCIES Omega - Global navigating by VLF fix
U		M79-32722
UH-60A HELICOPTER		Environmental effects on VLF navigation systems,
Fewer controls, easier inspection - Diffusi	ion	OMEGA
bonding shows cost advantages		[AD-A063882] N79-22073
	A79-33591	VIBRATION
ULTRASONIC SOLDEBING		Correlation study between vibrational
Ultrasonic bonding arrives - 75% cost savin		environmental and failure rates of civil
	A79-33586	helicopter components
UNIFORM PLOW		[NASA-CR-159033] N79-23064
An investigation into the transient aerodyr		VIBRATION DAMPING
associated with a speiler emerging into a uniform airstream	1	Recent progress in active controls applied to
Unitorm airstream [BU-219]	N79-23046	flutter suppressors
UNSTEADY PLOW	2JU40	Friction damping of resonant stresses in gas
	ed flow	turbine engine airfoils
Unsteady effects on a stailed wind in buise		[ASME PAPER 79-GT-109] A79-32384
Unsteady effects on a stalled wing in pulse - Comparison with back-and-forth oscillat	A79-32288	Oil squeeze film dampers for reducing vibration of
		aircraft gas turbine engines
- Comparison with back-and-forth oscillat		[ASME PAPER 79-GT-133] A79-32402
- Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel	A79-32290	Engine evaluation of a vibration damping treatment
- Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel Review of problems of unsteady aerodynamics		Engine evaluation of a vibration damping treatment for inlet guide vanes
- Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel	s of	Engine evaluation of a vibration damping treatment for inlet guide vanes [ASMF PAPER 79-GT-163] A79-32425
- Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel Review of problems of unsteady aerodynamics helicopters	s of A79-32293	Engine evaluation of a vibration damping treatment for inlet guide vanes [ASMF PAPER 79-GT-163] A79-32425 Damping capacity of paired shrouded turbine blades
- Comparison with back-and-forth oscillat Implementation of unsteady oscillatory flow transonic wind tunnel Review of problems of unsteady aerodynamics helicopters Experimental studies of unsteady aerodynamics	s of A79-32293	Engine evaluation of a vibration damping treatment for inlet guide vanes [ASME PAPER 79-GT-163] A79-32425 Damping capacity of paired shrouded turbine blades in relation to shroud contact conditions
- Comparison with back-and-forth oscillatory flow transonic wind tunnel Review of problems of unsteady aerodynamics helicopters Experimental studies of unsteady aerodynamics wind tunnel models of helicopter rotors	s of A79-32293	Engine evaluation of a vibration damping treatment for inlet guide vanes [ASMF PAPER 79-GT-163] A79-32425 Damping capacity of paired shrouded turbine blades

SUBJECT INDEX WIND TURNEL BODELS

Evaluation of the aerodynamic damping of t oscillations of turbine blades with a vi pitch, stagger angle, and curvature of b	ew to	VORTICITY Prediction and measurement of the aerodyname forces and pressure distributions of wind configurations at very high angles of at	g-taıl
VIBRATION ISOLATORS			N79-22025
<pre>Plastomer mounted rotors - An alternative smoother running turbcmachinery</pre>	for	\A /	
[ASME PAPER 79-GT-149]	A79-32414	VV	
Design and development of a motion compens	ator for	WALL PLOR	
the RSRA main rotor control		An experimental study of endwall and airfor	
	N79-22541	surface heat transfer in a large scale to	urbine
Polyurethane foams for aircraft shock moun	ts. 2:	blade cascade	120 22226
Polybutadiene based foams	N79-23219	[ASME PAPER 79-GT-99]	A79-32375
[AD-A064859] VIBRATION MODE	N/9-23219	WARNING SYSTEMS Conflict alert for the air traffic control	cucton
An analysis of aeroengine fan flutter usin	a tuin	conflict afert for the all traffic control	A79-33605
orthogonal vibration modes	y twin	Multichannel infrared receiver performance	
	A79-32395	airborne detection of antiaircraft missi	
VIBRATION PERCEPTION			A79-35210
Physical and subjective studies of aircraf	t	WASTE ENERGY UTILIZATION	
interior noise and vibration		Effect of friction on motion of a piston di	riven by
[NASA-TH-80084]	N79-23754	combustion products	
VIBRATION TESTS			A79-35656
Dynamic identification of light aircraft		WAVE EQUATIONS	_
structures and flutter certification		Aerodynamic noise theory lighthill meth	
[ONERA, IP NO. 1979-31]	A79-32302	turbulent flow, sound pressure, and wave	
VIBRATIONAL STRESS		SIND DOCUMENTON	N79-23378
Priction damping of resonant stresses in g	as	The priming of a wind tunnel with a hydraul	110
turbine engine airfoils [ASME PAPER 79-GT-109]	A79-32384	Compressor	110
VIBRATORY LOADS	B// 32304	Complessor	N79-23108
Aerodynamic and aeroelastic characteristic	s of	WEAPOB SYSTEMS	
oscillating loaded cascades at low Mach	number	Weapons for the black-box war	
[ASME PAPER 79-GT-112]	A79-32387	•	A79-34824
VIDEO COMMUNICATION		WEAPONS	
Global services systems - Space communicat		A brief review of air flight weapons	
[AIAA 79-0946]	A79-34761		N79-23051
VISCOUS PLOW	- 4- 41-	WEATHER MODIFICATION	
An application of 3-D viscous flow analysi design of a low-aspect-ratio turbine	s to the	A modern thermo-kinetic warm fog dispersal [AD-A064428]	N79-23595
[ASME PAPER 79-GI-53]	A79-32348	WEDGES	1173-23333
Hypersonic viscous shock layer on infinite		Prospects of using wedge-shaped models for	
arrow wings at angle of attack	•	investigating thermal fatigue of turbine	blades
•	A79-35158		A79-32825
VISIBILITY		WHITE HOISE	
Forward scatter meter measurements of slan	t Visual	Response of plate to nonstationary random	1040 1040 - 34604
range [AD-A064429]	N79-23062	WIND BPPECTS	E// 34004
VISUAL AIDS		Mechanism of extremity injuries occurring of	during
System description: Aviation Wide-Angle V	ısual	ejection from F-4 aircraft	•
System (AWAVS) Computer Image Generator	(CIG)		A79-33610
visual system		WIND SHEAR	_
[AD-A065060]	N79-23683	Detection of CAT and low altitude wind she	
VISUAL CONTROL Analysis of visual detection performance:	E-11	on-board aircraft IR sensors - An update	A79-33630
1978 experiment	raii	WIND TUNNEL APPARATUS	A/3-33030
[AD-A065118]	N79-23061	Improvements on the C4/Vernon wind tunnel -	
VOLUMETRIC ANALYSIS		transonic operation	
Closed power cycles analysis		[AAAF-NT-78-13]	N79-23123
	N79-22094	Construction problems specific to models fe	
VORTICES		Reynolds number wind tunnels scale mo	
Vortex pattern developing on the upper sur	face of	[AAAF-NT-78-02]	N79-23124
a swept wing at high angle of attack	*70 2202	WIND TUNNEL DRIVES	
Cubantianl dang puninciation for highly o	N79-22007	Large transonic wind tunnels	N70_22106
Subcritical drag minimization for highly s	wept	[VKI-LECTURE-SERIES-52]	N79-23105
wings with leading edge Vortices	N79-22021	The injector driven tunnel	N79-23106
An experimental investigation of the entra		Hydraulic compressor for a wind tunnel	
of a leading-edge vortex			N79-23107
• •	N79-22033	The priming of a wind tunnel with a hydrau.	lıc
Low-speed wind-tunnel parametric investiga	tion of	COBPRESSOR	
flight spoilers as trailing-vortex-allev	1ation		N79-23108
devices on a transport aircraft model		WIND TUNBEL BODELS	
[NASA-TP-1419]	N79-22038	Experimental studies of unsteady aerodynam:	cs on
Rotary-wing aerodynamics. Volume 1: Pasi	С	wind tunnel models of helicopter rotors	170 22205
theories of rotor aerodynamics with appl		Hand tunnel model study of the bet exhaust	A79-32295
to helicopters momentum, vortices, a potential theory	ii d	Wind tunnel model study of the hot exhaust from the compressor research facility at	Prame
[NASA-CR-3082]	ห79-22039	Wright-Patterson Air Force Base, Ohio	
Performance of a vortex-controlled diffuse		[ASME PAPER 79-GT-186]	A79-32445
annular swirl-can combustor at inlet Mac		An exploratory investigation of quasi-free	
numbers up to 0.53		models in a supersonic short-duration will	nd tunnel
[NASA-TP-1452]	N79-22099		A79-35925
Development of a viscous vortex/ving inter		Large transonic wind tunnels	wao oo
program for thick wings with bounded lea	ding edge N79-23020	[VKI-LECTURE-SERIES-52]	N79-23105
[AD-A065181]	1112-23020		

WIND TUNNEL TESTS SUBJECT INDEX

The design of models and their supports, the Evans clean-flow tunnel. A review of some of the various proposals the design of high	Modernization of the low speed wind tunnel at Breguet de Velizy: Measuring system modernization minicomputer T I 980A
Reynolds number, transonic wind tunnels N79-23110 Improvement of the aerodynamic circuit in the	[AAAF-NT-78-12] N79-23122 Improvements on the C4/Vernon wind tunnel transonic operation
Breguet-Velizy low speed wind tunnel [AAAF-NT-78-11] N79-23121	[AAAF-NT-78-13] N79-23123 The effect of blockage in shear flow in the wind
WIND TUNNEL TESTS Allocaft response to lateral gusts- Exploratory	tunnel [EU-221] N79-23125
study	SIND TUNNEL WALLS
A79-32278	Wall interference effects
Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290	N79-23113 User guide for STRMIN: A boundary-layer program for contoured wind-tunnel liner design
Computer-aided design - Aerodynamics A79-33456	[NASA-CR-159058] N79-23114 Effect of the model vertical position in a slotted
<pre>In-flight captive store loads compared with wind-tunnel and mathematical simulations</pre>	wall wind tunnel [AAAF-NT-78-05] N79-23119
A79-34595 Design guidelines for the application of forebody	Improvements on the C4/Vernon wind tunnel transonic operation
and nose strakes to a fighter aircraft based on	[AAAF-NT-78-13] N79-23123
F-16 wind tunnel testing experiment N79-22000	WIND TUNNELS The application of spanwise blowing for high angle
Wind tunnel test at low speeds of a dorsal air intake on a fighter configuration	of attack spin recovery N79-22004
N79-22029 A survey of recent high angle of attack; wind	Special Ground testing facilities and testing techniques for STOL aircraft
tunnel testing at Aeritalia	N79-23007
N79-22034	WINDSHIELDS Contor windshields made tougher - Special conting
Low-speed wind-tunnel investigation of a large-scale VTOL lift-fan transport model	Copter windshields made tougher - Special coating extends life, adds safety
[NASA-TM-78560] N79-22035	A79-33588
Experimental investigation of three helicopter rotor airfoils designed analytically in the Langley 6 by 19 inch and 6 by 28 inch transonic	Aircraft glassmaker windshield supply for Boeing 767 and 747 aircraft A79-34470
wind tunnels [NASA-TP-1396] N79-22037	Influence of gridboard line width and spacing on
[NASA-TP-1396] N79-22037 Low-speed wind-tunnel parametric investigation of	windscreen distortion measurements [AD-A065821] N79-23070
flight spoilers as trailing-vortex-alleviation	WING PLAPS
devices on a transport aircraft model [NASA-TF-1419] N79-22038	A study of the Sheriff's wing [BU-215] N79-23072
Surface pressure data for a supersonic-cruise	WING PLOW HETHOD TESTS
airplane configuration at Mach numbers of 2.30, 2.96, 3.30	Recent progress in active controls applied to flutter suppressors
[NASA-TM-80061] N79-22051	A79-32277
Wind tunnel corrections for STOL models N79-22998 Review of large low speed wind tunnel requirements	Unsteady effects on a stalled wing in pulsed flow - Comparison with back-and-forth oscillating case A79-32288
for STOL testing	Unsteady pressure measurements on rotor blade tips
Comparison of store trajectory and aerodynamic	A79-34534
loads, and model flow-field characteristics obtained in the AEDC PWT/4T and VFK/A wind	WING LOADING Lifting surface approach to the estimation of gust
tunnels at Mach number 1.63	response of finite wings
[AD-A065137] N79-23017 Effect of number of probes and their orientation	WING OSCILLATIONS
on the calculation of several compressor face	Recent progress in active controls applied to
distortion descriptors [NASA-TM-72859] N79-23087	flutter suppressors A79-32277
Wind-tunnel shock-tube simulation and evaluation	Unsteady pressure measurements on rotor blade tips
of blast effects on an engine inlet [AD-A065388] N79-23092	with incidence A79-34534
Buffeting measurements in flight and in a wind	The influence of sweep on the aerodynamic loading
tunnel T-33 aircraft [AAAF-NT-78-17] N79-23104	of an oscillating NACA 0012 airfoil. Volume 1: Technical report
Effects of flow turbulence and noise on	[NASA-CR-3092] N79-22052
aerodynamic phenomena and measured quantities wind tunnel tests and boundary layer	OPTIMIZATION of Wing structures to satisfy
transition	strength and frequency requirements
N79-23109 Experimental studies in a Ludwieg tube transonic	A79-35717 Bumblebee Program: Aerodynamic data. Part 4:
tunnel	Wing loads at Mach numbers 1.5 and 2.0
N79-23111 Notes concerning testing time requirements in	missile configurations [NASA-CH-3117] N79-22041
steady and unsteady measurements	Evaluation of composite wing for XFV-12A airplane,
N79-23112 Two dimensional anemometric probe two	appendix C [AD-A063848] N79-22215
dimensional flow. Wind tunnel tests	WING PROPILES
[AAAF-NT-78-09] N79-23116 Optical flow measurements: Applications to wind	Development of a viscous vortex/wing interaction program for thick wings with bounded leading edge
tunnels or motor bench tests	[AD-A065181] N79-23020
[AAAF-NT-78-07] N79-23117 Effect of the model vertical position in a slotted	WINGED VEHICLES Optimization of hypersonic three-dimensional shapes
wall wind tunnel	A79-35584
[AAAF-NT-78-05] N79-23119	WIEGS A computational scheme for structural influence
Similitude, manufacturing, identification, and instrumentation of test models aircraft models	coefficients of certain planar wings
[AAAF-NT-78-24] N79-23120	A79-34597

Britain's better airbus wing --- A-310 aircraft
wing design

A79-34823

Parameters of three-dimensional flow past a wing
near the free surface of a ponderable fluid
A79-35155

Aerodynamics and performance characteristics of
wing lift augmentation schemes

N79-23006

Computer program to calculate three-dimensional
boundary layer flows over wings with wall mass
transfer
[NASA-CR-3123]
Aerodynamics of low aspect ratio wings
N79-23016

Aerodynamics of low aspect ratio wings
N79-23053

WORKING PLUIDS
Closed power cycles' analysis

N79-22094

WORKLOADS (PSYCHOPHYSIOLOGY)
Plight evaluation BK 2 integrated controller
installed in an CH-58A helicopter
[AD-A065072]

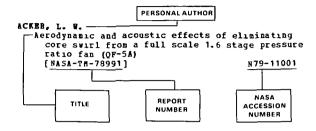
N79-23103

PERSONAL AUTHOR INDEX

AERONAUTICAL ENGINEERING / A Continuing Bibliography (Suppl 112)

AUGUST 1979

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter The report number helps to indicate the type of document cited (e.g. NASA report translation NASA contractor report) The accession number is located beneath and to the right of the title e.g. N79 11001 Under any one author's name the accession numbers are arranged in sequence with the IAA accession numbers appearing first

Α	
ABBOTT, T. S.	
Comparison of electromechanical and	
cathode-ray-tube display mediums for an	
instrument approach display	
[NASA-TM-80069]	N79-23080
ADACHI, T.	
Numerical analysis of flow through turbine	
cascades by the Modified FLIC Method	
	A79-32590
ADAHS, H. T.	
Digital data acquisition system for use in	
aircraft engine condition monitoring	
[ARL-MECH-ENG-REPT-151]	N79-23088
ADAMSKI, W.	
Numerical representation of aircraft geomet	179-32588
ADDERLEY, B.	A/9-32300
Measuring and improving ATC capacity	
neaduring and improving are capacity	A79-33024
ADRAIN, R. S.	B/3 33024
Preliminary studies using photon correlation	חת
velocimetry in turbomachinery and combust	
systems	
•	A79-34314
AHMADI, G.	
Response of plate to nonstationary random 1	
	A79-34604
AINSWORTE, R. W.	
Measurements of heat transfer in circular,	_
rectangular and triangular ducts, represe	nting
typical turbine blade internal cooling pa	ssages
using transient techniques	
[ASME PAPER 79-GT-40]	A79-32343
AKAI, J. T.	&
Aerodynamic and aeroelastic characteristics oscillating loaded cascades at low Mach m	
[ASME PAPER 79-GT-112]	A79-32387
AKAI, T. J.	A/3 32307
Aerodynamic and aeroelastic characteristics	of
oscillating loaded cascades at low Mach n	umher.
I - Pressure distribution, forces, and mo	
[ASME PAPER 79-GT-111]	A79-32386
AKKBRHAN, J. W.	
Hydrazine monopropellant reciprocating engi	ne
development	
	N79-22540
ALABIZ, O.	
Correlation study between vibrational	
environmental and failure rates of civil	
helicopter components	
[NASA-CR-159033]	N79-23064

ALBERY, W. B.	
Motion and force cueing requirements and	
techniques for advanced tactical aircra	ft
simulation [AD-A064691]	N79-23102
ALLI, P.	M73-23102
Present fatigue analysis and design of he	licopters
requirements and qualification procedure	es
AUDURACE C .	N79-23078
ANDRESON, C. A. Design guidelines for the application of	forobody
Design guidelines for the application of and mose strakes to a fighter aircraft	hased on
F-16 wind tunnel testing experiment	Dabea on
• •	N79-22000
ANDERSON, E. C.	
User guide for STRMLN: A boundary-layer	program
for contoured wind-tunnel liner design [NASA-CR-159058]	N79-23114
ANGELINO, G.	N/3-23114
Closed power cycles' analysis	
• • • • • • • • • • • • • • • • • • • •	N79-22094
ANTONA, P. L.	
Heat treatment of P/H nickel-base superal	loys for
turbine disks	N79-23254
OYAGI, K.	N/3-23234
Low-speed wind-tunnel investigation of a	
large-scale VTOL lift-fan transport mode	el
[NASA-TM-78560]	N79-22035
ARDRE, R. W.	
US Army helicopter fatigue requirements a substantiation procedures	nd
substantiation procedures	N79-23075
RNAIZ, H. H.	25075
Effect of number of probes and their ories	ntation
on the calculation of several compressor	r face
distortion descriptors [NASA-TM-72859]	N79-23087
ENDT, R. B. A.	N/9-2308/
Peak Strouhal frequency of subsonic jet no	oise as a
function of Reynolds number	
	A79-34537
Asymmetry of a circular jet observed in no	ear and
far fields	A79-34539
TASSI. H.	873-34333
Aerodynamic and aeroelastic characteristic	cs of
oscillating loaded cascades at low Mach	number.
I - Pressure distribution, forces, and in	moments
[ASME PAPER 79-GT-111]	A79-32386
Aerodynamic and aeroelastic characteristic	
oscillating loaded cascades at low Mach	A79-32387
THANS, H.	H/3-3230/
Investigation of the Multiple Method Adapt	tive
Control (MBAC) method for flight control	l systems
[NASA-CR-3089]	ท79-23099
U, D.	_
Standard Avionics Modules (SAM) for exists	
[AD-A065629] VEZARD, L.	N79-23083
Light propeller aircraft noise	
, feeteres and	A79-34980
D	

BARLITSKII, V. R.
Correlation-extremal direction finding of extended and point sources of electromagnetic oscillations

A79-32828

BALALARY, V. A.

Rvaluation of the aerodynamic damping of the
oscillations of turbine blades with a view to pitch, stagger angle, and curvature of blades

BALLAL, D. R. PERSONAL AUTHOR INDEX

BALLAL, D. R.	BERNSTEIN, S.
Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires	Procedure for noise prediction and optimization of advanced technology propellers
[AD-A065153] N79-23181	[NASA-CR-3080] N79-22100
BAMBERT, K.	BEST, J. T.
The influence of the blading surface roughness on	Comparison of store trajectory and aerodynamic
the aerodynamic behavior and characteristic of an axial compressor	loads, and model flow-field characteristics obtained in the AEDC PWT/4T and VPK/A wind
[ASME PAPER 79-GT-102] A79-32378	tunnels at Mach number 1.63
Optimization for rotor blades of tandem design for	[AD-A065137] N79-23017
axial flow compressors	BICK, P. A.
[ASME PAPER 79-GT-125] A79-32394 Dynamic behaviour and control of single-shaft	Dynamic behavior of aircraft materials [AD-A064592] N79-22078
closed-cycle gas turbines	[AD-A064592] N79-22078 BILLMANN, B. R.
N79-22095	Beacon-based collision avoidance system -
BANNISTER, A.	Experimental results
An investigation into the transient aerodynamics	A79-33606
associated with a spoiler emerging into a uniform airstream	BINGHAM, G. J. Experimental investigation of three helicopter
[BU-219] N79-23046	rotor airfoils designed analytically
BARAN, Y.	[NASA-TP-1396] N79-22037
Investigation of the Multiple Method Adaptive	BLACKBURN, W.
Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099	Preliminary design study of a composite main rotor blade for the OH-58 helicopter. Volume 1:
BARBEE, G. M.	Trade analysis and preliminary design study of
A study of embedded computer system software	composite OH-58 main rotor blade
acquisition management and recommendations to	[AD-A064159] N79-22080
improve development visibility [AD-A065879] N79-23681	BLAIR, M. P. An experimental study of endwall and airfoil
BARNES, G. A.	surface heat transfer in a large scale turbine
Bumblebee Program: Aerodynamic data. Part 4:	blade cascade
Wing loads at Mach numbers 1.5 and 2.0 [NASA-CR-3117] N79-22041	[ASME PAPER 79-GT-99] A79-32375
BAUMGARTHER, R.	BLAKNEY, D. F. The generation, radiation and prediction of
Cost-effective production of flight vehicle shells	supersonic jet noise. Volume 2, appendix:
by the pressure and flow-pressure processes	Computer program listing
[DGLR PAPER 79-008] A79-32305	[AD-A064685] N79-22854
BAZIN, M. Construction problems specific to models for high	BLEASDALE, G. W. A research study into the reliability of various
Reynolds number wind tunnels	fuel, hydraulic and air conditioning components
[AAAF-NT-78-02] N79-23124	of military aircraft
BEANS, E. W.	A79-33459
Relationships for nozzle performance coefficients [ASME PAPER 79-GT-145] A79-32411	BLUFORD, G. S., JR. A numerical solution of supersonic and hypersonic
BBARD, B. D.	viscous flow fields around thin planar delta wings
Environmental effects on VLF navigation systems,	[AD-A065632] N79-23028
ONEGA [AD-A063882] N79-22073	BLUMBR, T. P.
[AD-A063882] N79-22073 BEAVERS, R. R.	An analysis of short haul air passenger demand, volume 2
Applicability of fiber optics to aircraft fire	[NASA-CR-152157] N79-22063
detection systems	BOHL, JC.
[AD-A063974] N79-22882 BECKETT, A. J.	Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors
Analysis of the mechanical properties of rigid	A79-32295
foams with particular consideration of a rigid	BOHN, D.
polyether structural foam	Unsteady upstream effects in axial-flow supersonic
[BU-229] N79-23227 BELL, V. L.	compressor stages [ASME PAPER 79-GT-55] A79-32350
Source of released carbon fibers	BOLZ, E. H.
N79-22200	General aviation IPR operational problems
BRMENT, L. J.	[NASA-CR-159022] N79-22068
Helicopter emergency escape A79-33626	BOWASSAR, M. J. Fewer controls, easier inspection - Diffusion
BENDAHI, A.	bonding shows cost advantages
Heat treatment of P/M nickel-base superalloys for	A79-33591
turbine disks	BOOTH, H. J.
N79-23254	Polyurethane foams for aircraft shock mounts. 2: Polybutadiene based foams
The time-variant aerodynamic response of a stator	[AD-A064859] N79-23219
row including the effects of airfoil camber	BOOTE, T. C.
[ASME PAPER 79-GT-110] A79-32385	An application of 3-D viscous flow analysis to the
BENZ, D. Economical processing for the fabrication of CFRP	design of a low-aspect-ratio turbine [ASMY PAPER 79-GT-53] A79-32348
components	BORGON, J.
[DGLR PAPER 79-009] A79-33600	Selected problems concerning unstable operation of
BERG, D. P.	aircraft turbine engine compressors
Analytical derivatives [AD-A064944] N79-23090	ROUTS 7
BERGERON, D. A.	BOUIS, X. Optical flow measurements: Applications to wind
User's guide to data preparation: Photogrammetric	tunnels or motor bench tests
navigation analysis program Potonap	[AAAF-NT-78-07] N79-23117
[AD-A064614] N79-22070	BOULAY, JL.
Kalman filtering and smoothing in Potonap for orbit determination using GPS measurements	Suppression of radio-electrical disturbances of electrostatic origin on aircraft
[AD-A064613] N79-22071	A79-34978
BERNHRIH, J. P.	BOUTHILETTE, D. R.
Improvements on the C4/Vernon wind tunnel [AAAF-NT-78-13] N79-23123	Analysis of visual detection performance: Fall 1978 experiment
[man. mi = 10 = 13] m13 = 23 123	[AD-A065118] N79-23061

PRESORAL AUTHOR INDEX COLLEY, W. C.

BRADLEY, B. D.		CARRODUS, J. A.	
An appraisal of models used in life cycle estimation for USAF aircraft systems	cost	Airworthiness and certification aspects of aircraft for STOL	clvil
[AD-A064333]	N79-22964	allerate for Stop	N79-22997
BRADSHAW, J. E.		CARTA, F. O.	
Advanced technology fuel mass flowmeter [AD-A063963]	N79-22108	Effect of interblade phase angle and incid angle on cascade pitching stability	lence
BRANSTETTER, J. B.		[ASME PAPER 79-GT-153]	A79-32418
Evaluation of a remote tone signaling control/monitor system as lightning/tra:	na. ont	The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo	
protection for solid state instrument 1		Technical report	rune i.
systems		[NASA-CR-3092]	N79-22052
[AD-A063766] BRAHT, G.	N79-22116	CASTABOR, D. Investigation of the Bultiple Method Adapt	170
Lo-frequency augmentor instability study		Control (MMAC) method for flight control	
[AD-A065144]	N79-22104	[NASA-CR-3089]	ท79-23099
Lo-frequency augmentor instability investa computer program user's manual	1gation	CHAMPINE, R. A. Flight investigation of piloting technique	es and
[AD-A065774]	N79-23093	crosswind limitations using a research t	
BREBNER, G. G.		crosswind landing gear	N70-22012
A brief review of air flight weapons	N79-23051	[NASA-TP-1423] CHAPPLE, P. N.	N79-23012
BRITT, J. E.		Aerodynamic design of fixed and variable of	geometry
Omega possibilities: Limitations, options	s, and	nozzleless turbine casings	A79-32364
opportunities [AD-A065027]	N79-23063	[ASME PAPER GT-87] CHAUVIN, J.	A79-32304
BROCKHANN, W.		Aerodynamic problems in cooled turbine bla	ding
The nature of adhesion mechanisms and the influence of surface treatments on the		design for small gas turbine	N79-22091
of bonded joints	Dengalogi	Shock-boundary layer interaction in compre	
	N79-23455	cascades: A review of available data	
BROICHHAUSEN, KD. Unsteady upstream effects in axial-flow s	nnerson: c	CHEN, R. T. N.	N79-23428
compressor stages	-	A piloted simulator study on augmentation	systems
[ASME PAPER 79-GT-55]	A79-32350	to improve helicopter flying qualities i	. n
BROWN, S. L. Analyzing technology potential for strate	gic airlift	terrain flight [NASA-TM-78571]	N79-23098
[AIAA 79-0841]	A79-33828	CHERNIAVSKII, S. IU.	
BRYDER, W. R. B. Alrworthiness and certification aspects of	f armil	Effect of friction on motion of a piston d combustion products	riven pa
aircraft for STOL	I CIVII	compassion products	A79-35656
	N79-22997	CHOMBARD, J.	
BRYKIHA, I. G. Hypersonic viscous shock layer on infinite	e-snan	Light propeller aircraft noise	A79-34980
arrow wings at angle of attack	C DPuL	CHOMETON, F.	2., 5.,00
DUCCI INTEL C	A79-35158	The priming of a wind tunnel with a hydrau	llic
BUCCIANTINI, G. A survey of recent high angle of attack;	wind	compressor	N79-23108
tunnel testing at Aeritalia		CHRISTOPHE, J.	
BURGER, G. D.	N79-22034	Special Ground testing facilities and test techniques for STOL aircraft	ing
Study of blade aspect ratio on a compresso	or front	tooning and too broad direction	N79-23007
stage aerodynamic and mechanical design	report N79-23085	European transonic wind tunnel project for	high
[NASA-CR-159555] BURNS, G.	N/3-23003	Reynolds numbers [AAAF-NT-78-01]	N79-23118
Predesign of the second generation compre	hensive	CHU, R. K.	
helicopter analysis system [AD-A064289]	N79-22084	Catalytic combustion for gas turbine appli [ASME PAPER 79-GT-188]	.cations 179-32447
BURROWS, L.	N75 22004	CLARKE, R. W. G.	175 32441
Aerodynamic problems in cooled turbine bla	adıng	Advanced application of the MADGE approach	ald
design for small gas turbine	พ79-22091	offshore	A79-33457
BUTLER, E. A.		CLAUS, R. W.	
Definition of requirements for a performan		Effect of primary-zone equivalence ratio o	n
measurement system for C-5 aircrew member [AD-A063282]	N79-22119	pollutant formation [NASA-TP-1463]	N79-23086
BYRAH, T. R.		COCQUEREZ, J. L.	_
The effect of surface imperfections on the aerodynamic performance of an airfoil a		Aircraft response to lateral gusts- Explor study	atory
moderate Reynolds numbers			A79-32278
[BU-217]	N79-23048	COLACICCO, B. J.	
•		Inflatable survival systems for helicopter	A79-33624
		COLE, H. W.	
CAME, H. J. The effect of surface imperfections on the	e	The principle and practice of 'clutch' rad operation	ar
aerodynamic performance of an airfoil a		·	A79-33025
moderate Reynolds numbers	N79-23048	COLIN, P. B.	1700000-
[BU-217] CARBOBARO, E.	M/3-23048	Review of large low speed wind tunnel requ for STOL testing	TTEMENTS
Wind tunnel corrections for STOL models		•	N79-22999
CARR, E.	N79-22998	COLLARD, D. Behavior of a transport aircraft with a hi	αh
The combustion of a range of distillate for	uels in	aspect ratio wing at a high angle of inc	idence
small gas turbine engines			N79-22005
[ASME PAPER 79-GT-175] CARRIERE, P.	A79-32435	COLLEY, W. C. Analytical derivatives	
The injector driven tunnel		[AD-A064944]	พ79-23090
	N79-23106		

COLLINS, I. K. PERSONAL AUTHOR INDEX

COLLINS, I. K.			
		DAVIS, W. L.	
Surface pressure data for a supersonic-cri	uise	An efficient algorithm for computing the	
airplane configuration at Mach numbers of		Q-guidance matrix	
2.96, 3.30		[AD-A064816]	N79-22074
[NASA-TM-80061]	N79-22051	DE HOPP, R. L.	
COLSON, H. J., JR.		Identification of a STOL propulsion plant	model
Application of model algorithmic control	to a	from flight data	
lightly damped single input single outpo		,	A79-34521
[AD-A064222]	N79-22115	DEAL, P. L.	3
COMBS, S. P.		Flight investigation of piloting technique	has and
Mechanism of extremity injuries occurring	during	crosswind limitations using a research	
ejection from F-4 aircraft	during	crosswind limitations using a research	c l be
election from L-4 affectate	A79-33610	[NASA-TP-1423]	N79-23012
COUNTY D P	#19-33010		M/3-23012
CONNER, D. W.		DEAN, R. C., JR.	
Technology requirements and readiness for	very	The fluid dynamic design of advanced cent	rirugar
large vehicles	.70 22020	compressors	*****
[AIAA 79-0851]	A79-33834		พ79-22508
CONVERSE, G. L.		DEMUTH, R. S.	_
Analytical derivatives		Laser balancing demonstration on a high-s	speed
[AD-A064944]	ห79-23090	flexible rotor	
COPBLAND, D.		[ASME PAPER 79-GT-56]	A79-32351
Predesign of the second generation compre	he n sı v e	DESILVESTRO, R.	
helicopter analysis system		A survey of recent high angle of attack;	wind
[AD-A064289]	N79-22084	tunnel testing at Aeritalia	
CORLETT, W. A.			N79-22034
Surface pressure data for a supersonic-cri	uise	DESTUYEDER, R.	
airplane configuration at Mach numbers of		Recent progress in active controls applie	ed to
2.96, 3.30	·	flutter suppressors	
[NASA-TH-80061]	N79-22051	••	A79-32277
CORNISH, J. J., III		DEVILLIER, H., JR.	
The application of spanwise blowing for h	on angle	Propulsion system considerations for the	subsonic
of attack spin recovery	iga ungio	V/STOL	542551145
or accaes plu recovery	N79-22004	[ASME PAPER 78-GT-57]	A79-32934
COTY, P. J.	117 22004	DEVINE, J.	117 52554
A design review of ceramic components for	+urbino	Ultrasonic bonding arrives - 75% cost sav	71 DGC COOD
engines	Carprue	officesoure bounding affives - 75% cost say	A79-33586
	A79-32442	TICECOE D D	M13-33300
[ASME PAPER 79-GT-183]	A73-32442	DICKSON, R. R.	
COURDOR, C.	41-	Radar track data correlation or reachable	sets
Improvement of the aerodynamic circuit in	tne	revisited: The reachable state	N70 22240
Breguet-Velizy low speed wind tunnel	N20 22121	[AD-A065045]	N79-23318
[AAAF-NT-78-11]	N79-23121	DIEKHANN, V. L.	
CRECELIUS, W. J.		Engineer design test 1, Hughes YAH-64, ad	ivanced
User's manual for steady state and transic		attack helicopter	N79-22077
thermal analysis of a shaft-bearing syst	cem	[AD-A064359]	M/9-220//
(SHABERTH)	W70 22522	DIETENBERGER, M.	1
[AD-A064150] CROEVICE, L. L.	N79-22523	<pre>Frost formation on an airfoil: A mathema model 1</pre>	it icai
	-+ //-		N79-22706
Bumblebee Program: Aerodynamic data. Par	LL 4.	[NASA-CR-3129]	8/3-22/00
Wing loads at Mach numbers 1.5 and 2.0		DIX, R. B.	
[NASA-CR-3117]	N79-22041	In-flight captive store loads compared wind-tunnel and mathematical simulation	
CROOM, D. R.	_	Wind-counter and mathematical Simulation	120
			170-34505
Low-speed wind-tunnel parametric investigation		RIVAN C I	A79-34595
flight spoilers as trailing-vortex-alle		DIXON, C. J.	
flight spoilers as trailing-vortex-alled devices on a transport aircraft model	viation	Development of a viscous vortex/wing inte	eraction
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419]		Development of a viscous vortex/wing inte program for thick wings with bounded le	eraction eading edge
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JR.	viation N79-22038	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181]	eraction
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JR. Review lecture on transport aircraft. Con	viation N79-22038	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181] DOMZALSKI, L. P.	eraction eading edge N79-23020
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JR.	viation N79-22038 acepts,	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181]	eraction eading edge N79-23020
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, B. J., JB. Review lecture on transport aircraft. Conductive contraction and prospects	viation N79-22038	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea	eraction eading edge N79-23020
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JR. Review lecture on transport aircraft. Con	N79-22038 ncepts, N79-23000	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H.	eraction eading edge N79-23020 ating A79-33623
flight spoilers as trailing-vortex-aller devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JR. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules	viation N79-22038 acepts,	Development of a viscous vortex/wing integroup for thick wings with bounded legal [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with loc	eraction eading edge N79-23020 ating A79-33623
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, B. J., JB. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R.	N79-22038 ncepts, N79-23000 N79-23001	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H.	eraction cading edge N79-23020 ating A79-33623 cal
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TF-1419] CROSS, B. J., JB. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. B. An off-design correlation of part span dar	N79-22038 ncepts, N79-23000 N79-23001	Development of a viscous vortex/wing integroup for thick wings with bounded le [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact	eraction eading edge N79-23020 ating A79-33623
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JR. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan rotor	wiation M79-22038 ncepts, M79-23000 M79-23001 nper	Development of a viscous vortex/wing integroup for thick wings with bounded legal [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact	eraction eading edge N79-23020 sting A79-33623 cal s A79-34973
flight spoilers as trailing-vortex-aller devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan rotoi [ASME PAPER 79-GT-6]	N79-22038 ncepts, N79-23000 N79-23001	Development of a viscous vortex/wing interprogram for thick wings with bounded less [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-marked	eraction eading edge N79-23020 ating A79-33623 cal .s A79-34973
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JB. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dam losses through transonic axial fan roton [ASME PAPER 79-GT-6] CUBBINGHAM, B. E.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329	Development of a viscous vortex/wing integroup for thick wings with bounded legan-bounded legan-boun	eraction eading edge N79-23020 ating A79-33623 cal .s A79-34973
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JB. Review lecture on transport aircraft. Condition and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dailosses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329	Development of a viscous vortex/wing interprogram for thick wings with bounded less [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-marked	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan rotoi [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery	N79-22038 ncepts, N79-23000 N79-23001 nper ts A79-32329	Development of a viscous vortex/wing interprogram for thick wings with bounded less [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy seasonated. DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impacts. DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seasonated.	eraction eading edge N79-23020 ating A79-33623 cal .s A79-34973
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dan losses through transonic axial fan roton [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149]	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329	Development of a viscous vortex/wing integram for thick wings with bounded legal and 1805181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy see DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection see a personnel parachutes DUPPI, J. V.	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, E. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, H. A.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414	Development of a viscous vortex/wing integroup for thick wings with bounded legal [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-mandingh-density packaging for ejection sea personnel parachutes DUFPY, J. V. Polyurethane foams for aircraft shock motors.	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHIBS, E. A. A computational scheme for structural infi	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locactions to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFI, J. V. Polyurethane foams for aircraft shock mot Polybutadiene based foams	eraction eading edge N79-23020 ating A79-33623 cal A79-34973 aintenance at-mounted A79-33616 ants. 2:
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, E. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, H. A.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414	Development of a viscous vortex/wing inte program for thick wings with bounded le [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with loc actions to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-mainingh-density packaging for ejection sea personnel parachutes DUFPY, J. V. Polyurethane foams for aircraft shock mot Polybutadiene based foams [AD-A064859]	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JB. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, H. A. A computational scheme for structural inficentiations of certain planar wings	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414	Development of a viscous vortex/wing integrous for thick wings with bounded legab-A065181] DOWZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-mandagh-density packaging for ejection sea personnel parachutes DUFPY, J. V. Polyurethane foams for aircraft shock more Polybutadiene based foams [AD-A064859] DUGAN, D. C.	eraction eading edge N79-23020 ating A79-33623 eal es A79-34973 eintenance eit-mounted A79-33616 ents. 2: N79-23219
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dar losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUBNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, B. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 Luence A79-34597	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more Polybutadiene based foams [AD-A064859] DUGAH, D. C. A piloted simulator study on augmentation	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616 conts. 2: N79-23219
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dail losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficentiations of certain planar wings CYRUS, J. D. Propulsion system considerations for the second contents of the second conten	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 Luence A79-34597	Development of a viscous vortex/wing integram for thick wings with bounded legation [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy seasonated. DOYLE, R. H. A comparison of costs associated with logactions to reduce aircraft noise impact of the cost of the c	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616 conts. 2: N79-23219
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPEB 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficential coefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing interprogram for thick wings with bounded less [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy see DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection see personnel parachutes DUFPI, J. V. Polyurethane foams for aircraft shock more polybutadiene based foams [AD-A064859] DUGAN, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight	eraction eading edge N79-23020 ating A79-33623 eal es A79-34973 eintenance ar9-33616 ents. 2: N79-23219 en systems in
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dail losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficentiations of certain planar wings CYRUS, J. D. Propulsion system considerations for the second contents of the second conten	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 Luence A79-34597	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more polybutadiene based foams [AD-A064859] DUGAH, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TR-78571]	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616 conts. 2: N79-23219
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan roton [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system V/STOL [ASME PAPER 78-GT-57]	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing integroup for thick wings with bounded leterated from the program for thick wings with bounded leterated from the program for thick wings with bounded leterated from the program for the program of the program	eraction eading edge N79-23020 uting A79-33623 eal A79-34973 nintenance ut-mounted A79-33616 ents. 2: N79-23219 entsystems in N79-23098
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPEB 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficential coefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more polybutadiene based foams [AD-A064859] DUGAH, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TR-78571]	eraction eading edge N79-23020 ating A79-33623 eal es A79-34973 eintenance eit-mounted A79-33616 ents. 2: N79-23219 en systems en N79-23098 enal shapes
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUBNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPER 79-GT-149] CUTCHINS, B. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system considerations for the system considerations.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more Polybutadiene based foams [AD-A064859] DUGAN, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TH-78571] DULOV, V. G. Optimization of hypersonic three-dimensions	eraction eading edge N79-23020 uting A79-33623 eal A79-34973 nintenance ut-mounted A79-33616 ents. 2: N79-23219 entsystems in N79-23098
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural inficentiation of certain planar wings CYRUS, J. D. Propulsion system considerations for the system. V/STOL [ASME PAPER 78-GT-57] D DABAN, C.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing integram for thick wings with bounded legation [AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-man high-density packaging for ejection sea personnel parachutes DUFPY, J. V. Polyurethane foams for aircraft shock more Polybutadiene based foams [AD-A064859] DUGAN, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TH-78571] DULOV, V. G. Optimization of hypersonic three-dimension	eraction eading edge N79-23020 Iting A79-33623 Eal ES A79-34973 Intenance It-mounted A79-33616 Ents. 2: N79-23219 Entsystems In N79-23098 Entages A79-35584
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUBNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPER 79-GT-149] CUTCHINS, B. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system considerations for the system considerations.	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic A79-32934	Development of a viscous vortex/wing integram for thick wings with bounded legation (AD-A065181] DOMZALSKI, L. P. U.S. Navy developments in crashworthy see DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-mand hagh-density packaging for ejection see personnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more Polybutadiene based foams [AD-A064859] DUGAN, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TH-78571] DULOV, V. G. Optimization of hypersonic three-dimensional processing attention of the Multiple Method Adaptive Control of the Mu	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616 ants. 2: N79-23219 a systems in N79-23098 conal shapes A79-35584 ctive
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPEE 79-GT-6] CUBNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPEE 79-GT-149] CUTCHINS, B. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system [ASME PAPEE 78-GT-57] D DABAN, C. Light propeller aircraft moise	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 luence A79-34597 subsonic	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locations to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more polybutadiene based foams [AD-A064859] DUGAH, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TH-78571] DULOV, V. G. Optimization of hypersonic three-dimensional control (MMAC) method for flight control (MMAC) method for flight control (MMAC) method for fight control (MMAC) method for flight contr	eraction eading edge N79-23020 ating A79-33623 and Eraction edge N79-34973 arithmenance att-mounted A79-33616 ants. 2: N79-23219 a systems in N79-23098 and shapes A79-35584 ative oil systems
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. R. An off-design correlation of part span dai losses through transonic axial fan roton [ASME PAPER 79-GT-6] CUNNINGHAM, R. E. Elastomer mounted rotors - An alternative smoother running turbomachinery [ASME PAPER 79-GT-149] CUTCHINS, B. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system V/STOL [ASME PAPER 78-GT-57] D DAHAN, C. Light propeller aircraft noise DARLOW, B. S.	N79-22038 ncepts, N79-23000 N79-23001 nper S A79-32329 for A79-32414 luence A79-34597 subsonic A79-32934	Development of a viscous vortex/wing integram for thick wings with bounded legation and the program for thick wings with bounded legations for thick wings with bounded legation in the program for thick wings with bounded legations. The program of	eraction eading edge N79-23020 ating A79-33623 cal cs A79-34973 aintenance at-mounted A79-33616 ants. 2: N79-23219 a systems in N79-23098 conal shapes A79-35584 ctive
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural infice officients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system V/STOL [ASME PAPER 78-GT-57] DAHAN, C. Light propeller aircraft noise DARLOW, M. S. Elastomer mounted rotors - An alternative	N79-22038 ncepts, N79-23000 N79-23001 nper S A79-32329 for A79-32414 luence A79-34597 subsonic A79-32934	Development of a viscous vortex/wing integrous for thick wings with bounded legation and the program for thick wings with bounded legation to the program for thick wings with bounded legation to the program for the program of the p	eraction eading edge N79-23020 ating A79-33623 at a section edge N79-34973 at a section edge N79-23219 at a systems in N79-23098 at a systems N79-23099 at a systems N79-23099
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPEE 79-GT-6] CUBNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPEE 79-GT-149] CUTCHINS, H. A. A computational scheme for structural inficoefficients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system V/STOL [ASME PAPEE 78-GT-57] DARBAY, C. Light propeller aircraft moise DARLOW, H. S. Elastomer mounted rotors - An alternative smoother running turbomachinery	N79-22038 ncepts, N79-23000 N79-23001 nper rs A79-32329 for A79-32414 Luence A79-34597 subsonic A79-32934 A79-32934	Development of a viscous vortex/wing interprogram for thick wings with bounded let [AD-A065181] DOBZALSKI, L. P. U.S. Navy developments in crashworthy sea DOYLE, R. H. A comparison of costs associated with locactions to reduce aircraft noise impact DREW, G. R. Development of hermetically sealed low-many high-density packaging for ejection seapersonnel parachutes DUFFY, J. V. Polyurethane foams for aircraft shock more polybutadiene based foams [AD-A064859] DUGAN, D. C. A piloted simulator study on augmentation to improve helicopter flying qualities terrain flight [NASA-TH-78571] DULOV, V. G. Optimization of hypersonic three-dimensional control (MMAC) method for flight control [NASA-CR-3089] DUNN, M. G. Heasurement of heat-transfer rate to a gas	eraction eading edge N79-23020 ating A79-33623 at a section edge N79-34973 at a section edge N79-23219 at a systems in N79-23098 at a systems N79-23099 at a systems N79-23099
flight spoilers as trailing-vortex-alled devices on a transport aircraft model [NASA-TP-1419] CROSS, E. J., JE. Review lecture on transport aircraft. Con utilization and prospects Takeoff and landing ground rules CROUSE, J. E. An off-design correlation of part span dai losses through transonic axial fan rotor [ASME PAPER 79-GT-6] CUNNINGHAM, B. E. Elastomer mounted rotors - An alternative smoother running turbemachinery [ASME PAPER 79-GT-149] CUTCHINS, M. A. A computational scheme for structural infice officients of certain planar wings CYRUS, J. D. Propulsion system considerations for the system V/STOL [ASME PAPER 78-GT-57] DAHAN, C. Light propeller aircraft noise DARLOW, M. S. Elastomer mounted rotors - An alternative	N79-22038 ncepts, N79-23000 N79-23001 nper S A79-32329 for A79-32414 luence A79-34597 subsonic A79-32934	Development of a viscous vortex/wing integrous for thick wings with bounded legation and the program for thick wings with bounded legation to the program for thick wings with bounded legation to the program for the program of the p	eraction eading edge N79-23020 ating A79-33623 at a section edge N79-34973 at a section edge N79-23219 at a systems in N79-23098 at a systems N79-23099 at a systems N79-23099

DUNNING, S. J.	FIDDES, S. P.
Multichannel infrared receiver performance A79-35210	Strake-induced separation from the leading edges of wings of moderate sweep
DUPRIEZ, F.	N79-22002
Similitude, manufacturing, identification, and instrumentation of test models	The influence of sweep on the aerodynamic loading
[AAAF-NT-78-24] N79-23120 DVORAK, B.	of an oscillating NACA 0012 airfoil. Volume 1: Technical report
The flow past a supersonic trailing edge in transonic turbing cascades	[NASA-CR-3092] N79-22052 PIRTH, J. A.
A79-32670	Test and evaluation of modified high performance jet aircrew life preserver
E	[AD-A063959] N79-22067 PISHER, B. D.
EARL, T. D.	Plight investigation of piloting techniques and
Concept for a large multi-mission amphibian aircraft [ATAA 79-0849] A79-33832	crosswind limitations using a research type crosswind landing gear
ECKERSLEY, R. B.	[NASA-TP-1423] N79-23012
A study of the Sheriff's wing	FLEETER, S.
[BU-215] N79-23072	The time-variant aerodynamic response of a stator
EDWARDS, B. C., JR. Analysis of visual detection performance: Fall	row including the effects of airfoil camber [ASME PAPER 79-GT-110] A79-32385
1978 experiment	Time-variant aerodynamics of oscillating airfoil
[AD-A065118] N79-23061	surfaces in a supersonic flowfield
General aviation IFR operational problems	A79-34531
[NASA-CR-159022] N79-22068	FLEMING, D. P. Laser balancing demonstration on a high-speed
EL-ATTAR, H. A.	flexible rotor
A general solution for distorted flows in cascades	[ASHE_PAPER 79-GT-56] A79-32351
of aerofoils [ASME PAPER 79-GT-65] A79-32353	FLYNN, P. P. Aerodynamic design of fixed and variable geometry
ELDER, R. L.	nozzleless turbine casings
Preliminary studies using photon correlation	[ASME PAPER GT-87] A79-32364
velocimetry in turbomachinery and combustion	POBIN, V. B.
systems A79-34314	On some methods for the numerical simulation of flows with complex structure
ENGEL, R. E.	A79-34691
Anatomy of an aircraft accident A79-33644	<pre>POORD, C. A. An analysis of aeroengine fan flutter using twin</pre>
BNGBL, R. L.	orthogonal vibration modes
Advanced Simulator for Pilot Training (ASPT): Aerial refueling visual simulation-engineering	[ASHE PAPER 79-GT-126] A79-32395 FORD, R. A. J.
[AD-A063283] N79-22118 ERIKSEN, S. B.	An analysis of aeroengine fan flutter using twin orthogonal vibration modes
An analysis of long and medium-haul air passenger	[ASME PAPER 79-GT-126] A79-32395
demand, volume 1 [NASA-CR-152156] N79-22062	PORMAN, P. Advanced flight control actuation system
ERLINE, T. F. Highly survivable truss tail boom	(AFCAS-E/P): Feasibility investigation of an electro/pneumatic dual power driven concept
[AD-A064181] N79-22079	[AD-A063992] N79-22114
ERNST, R.	PORNASTEE, L.
Lo-frequency augmentor instability investigation computer program user's manual	A survey of recent high angle of attack; wind
[AD-A065774] N79-23093	tunnel testing at Meritalia N79-22034
•	POURNIER, J.
F ,	Air France's Paris-Tokyo transpolar flight in 1978 A79-32583
PABUNNI, J. A.	FOURT, F.
Forced vibrations of a single stage axial	Evaluation of an energy distribution system for
compressor rotor	helicopter landing gears during hard landing
[ASME PAPER 79-GT-108] . A79-32383 PARASSAT, P.	[AD-A065298] N79-23069 FRAGA, D.
The derivation of a thickness noise formula for	Review lecture on transport aircraft. Concepts,
the far-field by Isom	utilization and prospects
A79-35449	N79-23000
PARRAR, F. A. Nonlinear stochastic control design for gas	FRIEDBL, H. The aerodynamics and performance characteristics
turbine engines	of direct lift schemes
[AD-A065075] N79-22103	N79-23004
PARRIS, L. High strength stitching for aircraft personnel	PRIBORICH, B. Solution of boundary value problems for the
restraint systems	vibration equation for a jet engine model
A79-33639	A79-35895
PAVIER, D. Unsteady effects on a stalled wing in pulsed flow	PRIGNAC, JP.
- Comparison with back-and-forth oscillating case A79-32288	The growth and evolution of the TPE331 [ASME PAPER 79-GT-164] A79-32426
PAY, 8.	C
Flight dynamics problems with STOL operation	G
N79-23003	GAINES, P. B.
PEJER, A. A. Studies of the dynamic stall or airfoil profiles	Airport noise control and land use compatibility study
for helicopter rotors	A79-34972
[AD-A065106] N79-23071	GALLOT, J.
PEUCHT, B. E. Advanced flight control actuation system	Review of problems of unsteady aerodynamics of
(AFCAS-E/P): Peasibility investigation of an	helicopters A79-32293
electro/pneumatic dual power driven concept	# J##JJ
[AD-A063992] N79-22114	

GALLUS, H. E.		GUNKO, IU. P.	· +ho
Unsteady upstream effects in axial-flow s compressor stages		Investigation of the regimes of flow past upper surfaces of delta wings with shoot	
[ASME PAPER 79-GT-55] GARREN, J. F., JE.	A79-32350	separated from the leading edges	A79-35110
Filtering technique based on high-frequer modeling for high-gain control	N79-23097	Н	
[NASA-CASE-LAR-12215-1] GEISLER, E. B.		HAASZ, A. A.	
Porward scatter meter measurements of sla range		Traffic background level and signal durat effects on aircraft noise judgment	
[AD-A064429] GERBER, F. E.	N79-23062	HABASHI, W. G.	A79-34580
Aerodynamic effects simulator		A finite element approach to subsonic aer	
GERDES, R. H.	A79-33617	HABERCOE, G. B., JR.	A79-35777
A piloted simulator study on augmentation to improve helicopter flying qualities		Turbine blades: Erosion and Corrosion. from the NTIS data base	
terrain flight [NASA-TM-78571] GERSHBEIM, E. A.	N79-23098	[NTIS/PS-79/0148/1] Turbine blades: Erosion and Corrosion. from the Engineering Index data base	N79-22111 Citations
Hypersonic viscous shock layer on infinit	te-span	[NTIS/PS-79/0149/9]	N79-22112
arrow wings at angle of attack	A79-35158	BAGEN, J. P. Flight evaluation MK 2 integrated control	ler
GIBOIN, B. Navigation by satellites		installed in an OH-58A helicopter [AD-A065072]	N79-23103
	A79-32582	HAINES, A. B.	
GILBORE, D. R., JR. Assessment of augmented electronic fuel of	controls	Computer-aided design - Aerodynamics	A79-33456
for modular engine diagnostics and cond		HALL, A. D.	nroach
monitoring [AD-A065128]	N79-23091	Helicopter fatigue evaluation. The UK ap	N79-23076
GOBERT, J. L. Implementation of unsteady oscillatory fl	love in a	HALL, D. W. Extended analytical study of the	
transonic wind tunnel		free-wing/free-trimmer concept	
GOLD, D.	A79-32290	[NASA-CR-3135] HALPIN, B. M., JR.	N79-22040
Milestones in the history of parachute de		Composites tooling speeds fabrication - E	nergy,
GOOD, W. D.	A79-33620 -	labor cost cut sharply	A79-33587
Thermodynamics of organic compounds [AD-A065664]	N79-23232	RAMBICK, T. Predesign of the second generation compre	hensive
GOPALAKRISHNAN, S.	N79-23232	helicopter analysis system	
Sample calculation 4: Phi = 9 deg 57	N79-22490	[AD-A064289] HANNAN, S.	N79-22084
GOPALAPILLAI, G. S.		Advanced Simulator for Pilot Training (AS	
Error analysis of a satellite interferome havigation system	eter	Aerial refueling visual simulation-engi	N79-22118
[NASA TASK 3] GORLINE, G. A.	A79-35097	HARDERSEN, C. Preliminary design study of a composite m	ain rotor
Composites tooling speeds fabrication - E labor cost cut sharply	nergy,	blade for the OH-58 helicopter. Volume Trade analysis and preliminary design s	1:
Brosion resistant clad rotor blades - Bor	A79-33587	composite OH-58 main rotor blade [AD-A064159]	N79-22080
coatings do the job		BARDI, L.	
GORODETSKII, S. S.	A79-33590	An experimental study of the response of turbo-machine rotor to a low frequency	
Damping capacity of paired shrouded turbi in relation to shroud contact condition		distortion [AD-A064776]	N79-23089
	A79-32827	HARDY, J. H.	
GRAHAM, C. G. Shock boundary layer interaction on high	turning	Afterbody tests in the Modane hot gas ben [AAAF-NT-78-10]	N79-23095
transonic turbine cascades	A79-32342	HARRIS, R. B. Active control transport design criteria	W75 0304
GRAZIANI, R. A. An experimental study of endwall and airf	Eo11	[PAPER-6663] HARRISOH, W. D.	N79-23065
surface heat transfer in a large scale blade cascade		Aircrew experiences in USAF ejections, 19	71-1977 A79-33609
[ASME PAPER 79-GT-99] GREEN, C. S.	A79-32375	BATFIBLD, N. D. New technology S61N simulator	
Investigation of the Multiple Method Adap			A79-33458
Control (MNAC) method for flight contro [NASA-CR-3089]	ol systems N79-23099	Buffeting measurements in flight and in a	wing.
GRIPFIN, J. H. Friction damping of resonant stresses in	gas	tunnel [AAAF-NT-78-17]	N79-23104
 turbine engine airfoils 		HAYASHI, Y. Numerical analysis of flow through turbin	ne.
[ASHE PAPER 79-GT-109] GUILLIEN, G.	A79-32384	cascades by the Hodified PLIC Method	
Light propeller aircraft noise	A79-34980	HEINRICH, H. G.	A79-32590
GUH, D. R.	A13 34300	On the status of experimental stress anal	ysıs of
Motion and force cueing requirements and techniques for advanced tactical aircra	ift	parachute canopies	A79-33646
simulation		RENDERSON, J. P.	
[AD-A064691]	N79-23102	Engine evaluation of a vibration damping for inlet guide vanes	rreatment
		[ASME PAPER 79-GT-163]	A79-32425

BERING, W. S. Porward scatter meter measurements of slan range	ıt v ısual	HUTTERER, K. Economical processing for the fabrication of components	of CPRP
[AD-A064429]	N79-23062	[DGLE PAPER 79-009]	A79-33600
EEWITSON, V. S. European scientific notes, volume 32, numb [AD-A065400]	er 5 N79-23885	1	
HEYLAUPP, B.		IAMERKO, M. M.	
An experimental passive microwave attitude measurement system for escape system ste		On some methods for the numerical simulati flows with complex structure	on of A79-34691
HIGA, W. H.		ILIPP, K. W.	
Centrifugal-reciprocating compressor [NASA-CASE-NPO-14597-1] HILL, D. W., JR.	N79-23431	Important factors in the maximum likelihoo analysis of flight test maneuvers [NASA-TP-1459]	a N79-22113
Comparison of store trajectory and aerodyn loads, and model flow-field characterist obtained in the AEDC PWT/4T and VFK/A wi	:1CS	IYBBGAR, B. G. B. Optimization of wing structures to satisfy strength and frequency requirements	
tunnels at Mach number 1.63 [AD-A065137]	N79-23017		A79-35717
HILL, R. M.		J	
An economic model of the manufacturers at production and airline earnings potentia		JACKSON, P. B., III	
volume 3	N79-22064	Calibration of the AEDC-PWT 16-foot transo	
[NASA-CR-152158] HILLER, 8.	M/9-22004	, tunnel aerodynamic test section at vario Reynolds numbers	us
A method for the optimal layout of driving mechanisms of the alleron for gliders an		[AD-A065112] JACKSOH, H. R.	N79-22117
motorplanes	A79-35921	Applicability of fiber optics to aircraft detection systems	
HIRAYAMA, W. Performance estimation of partial admission	on turbines	[AD-A063974] JANCOVICH, S. G.	N79-22882
[ASHE PAPER 79-GT-123]	A79-32392	The electro-impulse de-icing method	w70 02072
HIRST, M. Simulators cutting the fuel bill		[BU-227] JAY, R. L.	N79-23073
HOCK, W. J., III	A79-32750	The time-variant aerodynamic response of a row including the effects of airfoil cam	
Aerodynamic effects simulator	A79-33617	[ASME PAPER 79-GT-110]	A79-32385
HOFFRICHTER, J. S.	M/9-3301/	JEPPREY, P. Design and development of a motion compens.	ator for
OH-58 composite main rotor blades prelimin design investigation.	nary	the RSRA main rotor control	N79-22541
-[AD-A065010]	N79-22085	JENKINS, H. W. H.	
HOBICZ, G. F. Three-dimensional lifting-surface theory f	or an	The application of spanwise blowing for his of attack spin recovery	gh angle
annular blade row [ASME PAPER 79-GT-182]	A79-32441		N79-22004
HOOPER, J. A.		JEPSON, W. D. The influence of sweep on the aerodynamic	
Engine integration and noise consideration STOL aircraft	N79-23005	of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092]	lume 1: N79-22052
HOOPER, J. O.		JOBE, B.	
An experimental passive microwave attitude measurement system for escape system ste		High angle of attack characteristics of di- fighter configurations	fferent N79-21998
HOSHIYA, S.		JOHNSTON, G. W.	
Oil squeeze film dappers for reducing wibr aircraft gas turbine engines [ASME PAPER 79-GT-133]	A79-32402	Traffic background level and signal duration effects on aircraft noise judgment	on A79-34580
HOWARD, J. C. Computer formulations of aircraft models f	·a-	JOBES, G.	
simulation studies		Study of installed environment of various equipments in military aircraft	
[NASA-TP-1470] HUBER, R.	N79-23008	JOHES, S. W.	A79-33460
Design and development of a motion compens the RSRA main rotor control		Elastomer mounted rotors - An alternative a smoother running turbomachinery	
HUGON, P.	N79-22541	[ASHE PAPER 79-GT-149] JOHES, T. V.	A79-32414
Air France's Paris-Tokyo transpolar flight	A79-32583	Measurements of heat transfer in circular, rectangular and triangular ducts, represe typical turbine blade internal cooling pa	
Threat logic for air-derived CAS	A79-33608	using transient techniques [ASME PAPER 79-GT-40]	A79-32343
HUNT, A. The trajectories of spherical particles in	flow	JORDAN, B. J. Assessment of augmented electronic fuel con	
through cascaded turning vanes [BU-220]	N79-23096	for modular engine diagnostics and condi- monitoring	
HUNT, L. Predesign of the second generation compreh	ensive	[AD-A065128] JORGENSEN, L. H.	N79-23091
helicopter analysis system	N79-22084	Prediction of aerodynamic characteristics	
[AD-A064289] HUSTON, R. J.	a/3-22U04	slender bodies alone and with-lifting sur to high angles of attack	
Carbon Fiber Risk Analysis: Conclusions	N79-22209	JOU, W. E.	N79-22023
BUTCHIRSON, C. B.		Procedure for noise prediction and optimiza	of, norta
Omega - Global navigating by VLF fix	A79-32722	advanced technology propellers [NASA-CR-3080]	N79-22100

JOY, W.	KRA!	OS, W.	
Regression simulation of turbine engine	, i	High angle of attack characteristics of di	fferent
performance/aircraft regression model	70 00106	fighter configurations	N70 2100
[AD-A063975] N' JUSTICE, N. A.	79-22106	VCHUK, L. V.	N79-2199
Practical 'on-engine' microprocessor control		Prospects of using wedge-shaped models for	
monitoring systems for gas turbines		investigating thermal fatigue of turbine	
	79-32440		A79-3282
/		HELY, R.	
, K	;	Advanced flight control actuation system	
FAT DI VAD A		(APCAS-E/P): Feasibility investigation electro/pneumatic dual power driven conce	
KALBIKAR, A. An assessment of national risk: General cond	cents	[AD-A063992]	ерс №79-2211:
and overall approach		Y, G.	M75 2211
		Dynamic behaviour and control of single-sha	aft
KAMINSKI, J.		closed-cycle gas turbines	
Propulsion system considerations for the subs			N79-2209
V/STOL		LL, W. V.	ant son c
[ASME PAPER 78-GT-57] AT KASPER, J. F., JR.	79-32934	Catalytic combustion for gas turbine applic [ASME PAPER 79-GT-188]	A79-3244
Omega - Global navigating by VLF fix	KRO1	N, G. J.	
		Motion and force cueing requirements and	
KATO, K.		techniques for advanced tactical aircraft	t
The role of the backside parameter in height		simulation	
	79-34522	[AD-A064691] LNAN, W. H.	N79-2310
KATZEFF, H. E. U.S. Navy developments in crashworthy seating		Demand for large freighter aircraft as proj	rected
	79-33623	by the NASA cargo/logistics airlift syste	
KAY, B. F.		studies	
Helicopter transparent enclosures. Volume 2:		[AIAA 79-0842]	A79-33829
general specification		Demand for large freighter aircraft as pro	
[AD-A065462] Helicopter transparent enclosures. Volume 1:	79-23067	by the NASA cargo/logistics airlift syste [NASA-TM-80074]	em studie: N79-2206
Design handbook		R. P. B.	N/3 2200
		Detection of CAT and low altitude wind shea	ar by
KELLY, H. S.		on-board aircraft IR sensors - An update	
Ignition of fuel sprays by hot surfaces and			A79-33630
stabilization of aircraft fires		AR, P. Prost formation on an airfoil: A mathemat:	1
[AD-A065153] NO	79-23181 I	model 1	ıcaı
Miniature flow-direction and airspeed sensor	for	[NASA-CR-3129]	N79-2270
airplanes and radio controlled models in sp		KBL, B. A.	
studies		A modern thermo-kinetic warm fog dispersal	
[NASA-TP-1467] N7	79-23081	[AD-A064428]	N79-23595
KESSELRING, J. P.		MICEWICZ, T.	ng out
Catalytic combustion for gas turbine applicat	tions I	MICBWIC2, T. Dynamıc stability of a flight vehicle layın	ng out
Catalytic combustion for gas turbine applicat		MICEWICZ, T.	ng out A79-32919
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188]	tions I 79-32447	MICBWIC2, T. Dynamıc stability of a flight vehicle layın	
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel	tions 1 79-32447 wind	MICBWIC2, T. Dynamıc stability of a flight vehicle layın	
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the unnel [BU-221]	tions 1 79-32447 wind 79-23125	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line	
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C.	tions 1 79-32447 Wind 79-23125	MICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line L UC, T.	
Catalytic combustion for gas turbine applicate [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation	tions 1 79-32447 wind 79-23125 LABI	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line	
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C.	tions 1 79-32447 wind 79-23125 LABS	MICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line L UC, T.	A79-32919
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRPANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems	tions 179-32447 wind 79-23125 LABI	MICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-co	A79-32919 A79-3258
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A.	tions 1 79-32447 wind 79-23125 LABI 79-34314	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-contained as applied to low-to-moderate swe	A79-32919 A79-3258
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLINASHOV, A. A. Radiation field of a conformal phased array of	tions 179-32447 wind 79-23125 LABI 500 LACT 79-34314	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-contained as applied to low-to-moderate swelly wings. Volume 1: General trends	A79-32919 A79-32589 Oupled pt
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of	tions 1 79-32447 wind 79-23125 LABI con LACI 79-34314	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line L UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-cocanard as applied to low-to-moderate sweywings. Volume 1: General trends [AD-A063819]	A79-32919 A79-3258
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array of rotational-polarization elements situated of surface of revolution	tions 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-contained as applied to low-to-moderate swelly wings. Volume 1: General trends	A79-32919 A79-32584 oupled pt N79-2205
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated surface of revolution KLOSTER, M.	tions 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-contained as applied to low-to-moderate swe wings. Volume 1: General trends [AD-A063819] ON, P.	A79-32919 A79-32580 oupled pt N79-22050 lcs on
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array of rotational-polarization elements situated of surface of revolution KLOSTER, M. A special extension of the General Point	tions 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar BY, D. W. Aerodynamic characteristics of the close-cocanard as applied to low-to-moderate swe wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors	A79-32919 A79-32584 oupled pt N79-2205
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLINASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation	ilons 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line L UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swelly unique. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P.	A79-32919 A79-32580 oupled pt N79-22050 lcs on
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the runnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation	ilons 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-octoanard as applied to low-to-moderate swey wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors RANCE, P. Performance of a TAP-2 hydrofoil	A79-32580 oupled pt N79-22051 ics on A79-32299
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLINASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation	tions 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line L UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swelly unique. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P.	A79-32919 A79-32580 oupled pt N79-22050 lcs on
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the runnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array crotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KNEAFSEY, J. T. An economic model of the manufacturers aircin production and airline earnings potential,	tions 1 1 1 1 1 1 1 1 1	DYNAMIC Stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-content of the close-	A79-32584 oupled pt N79-2205 ics on A79-3229
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIHASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KWEAPSEY, J. T. An economic model of the manufacturers' aircu production and airline earnings potential, volume 3	tions 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-contained as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors Wind tunnel models of helicopter rotors EANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body	A79-32580 oupled pt N79-2205 ics on A79-32299 N79-2326
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLINASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KHEAPSEY, J. T. An economic model of the manufacturers' aircomproduction and airline earnings potential, volume 3 [NASA-CR-152158]	tions	Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors RANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of	A79-32919 A79-32580 oupled pt N79-22051 ics on A79-32299 N79-23265 s of canards
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the tunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array crotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KNBAFSEY, J. T. An economic model of the manufacturers airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demandary of the	Lions 1 1 1 1 1 1 1 1 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic und tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral (NASA-TP-1427)	A79-32580 oupled pt N79-2205 ics on A79-32299 N79-2326
Catalytic combustion for gas turbine applicate [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KWEAPSEY, J. T. An economic model of the manufacturers' airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demand for air transportation	tions 1 1 1 1 1 1 1 1 1	BICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-content of the close-conte	A79-32919 A79-32580 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23013
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLINASHOV, A. A. Radiation field of a conformal phased array croational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KHEAPSEY, J. T. An economic model of the manufacturers airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the dead for air transportation [NASA-CR-152191] KOBAYNKAWA, M.	tions	Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. EXPERIMENTAL Studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral (NASA-TP-1427) B, A. D. A design review of ceramic components for engines	A79-32919 A79-32580 oupled pt N79-22051 ics on A79-32299 N79-2326 s of canards N79-23013 turbine
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KMEAPSEY, J. T. An economic model of the manufacturers' airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demander of the study of	tions	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-content of the close-conte	A79-32919 A79-32580 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23013
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array of rotational-polarization elements situated surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KNEAFSEY, J. T. An economic model of the manufacturers' airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demotion of the content of	tions 1	NICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-control of the close-contr	A79-32919 A79-3258 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23011 turbine A79-3244
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIHASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KHEAFSEY, J. T. An economic model of the manufacturers' aircomproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demander of air transportation [NASA-CR-152191] KOBAYAKAWA, H. Lifting surface approach to the estimation of response of finite wings	tions 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic und tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral (NASA-TP-1427) B, A. D. A design review of ceramic components for engines [ASME PAPER 79-GT-183] G-LENDORPP, G. Designing, calculating, and manufacturing the stable of t	A79-32919 A79-32584 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23011 turbine A79-32443
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KMEAPSEY, J. T. An economic model of the manufacturers' airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demander of the surface approach to the estimation of response of finite wings KOREHATSU, K.	tions 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Acrodynamic characteristics of the close-control of the close-contr	A79-32919 A79-32580 oupled pt N79-22050 ics on A79-32299 N79-23260 s of canards N79-23010 turbine A79-32440 by means
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array contational-polarization elements situated surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KNEAFSEY, J. T. An economic model of the manufacturers' aircin production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demonstration of the content of the conten	tions 1	NICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors RANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of the components of the components for engines [ASM PAPER 79-GT-183] G-LENDORPP, G. Designing, calculating, and manufacturing of data processing	A79-32919 A79-32584 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23011 turbine A79-32443
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KMEAPSEY, J. T. An economic model of the manufacturers airci production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demander of air transportation [NASA-CR-152191] KOBAYAKAWA, H. Lifting surface approach to the estimation of response of finite wings KOREMATSU, K. Performance estimation of partial admission to [ASME PAPER 79-GT-123] KOST, FH.	tions 179-32447 wind 79-23125 Labi 79-32734 Lapi 79-32734 Lapi 79-32734 Lapi 79-22064 and Labi 79-22065 E gust Labi 79-34596 Lapi 79-32392 Labi 79-32392 Lab	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Acrodynamic characteristics of the close-control of the close-contr	A79-32919 A79-32580 oupled pt N79-22051 ics on A79-32299 N79-23260 s of canards N79-23013 turbine A79-32449 by means A79-32750 raft
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or otational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KHEAFSEY, J. T. An economic model of the manufacturers' aircomproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demonstration of air transportation [NASA-CR-152191] KOBAYAKAWA, B. Lifting surface approach to the estimation of response of finite wings KOREHATSU, K. Performance estimation of partial admission to [ASME PAPER 79-GT-123] KOST, FH. Shock boundary layer interaction on high turn	tions 179-32447 wind 79-23125 LABS 79-34314 of 79-32734 LAPS 79-35926 LABS 79-22064 and LABS 79-22065 f gust LABS 79-34596 LABS 79-32392 LABS	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of the components of the components for engines [ASME PAPER 79-GT-183] G-LENDORFF, G. Designing, calculating, and manufacturing of data processing GE, R. B. Large wing-in-ground effect transport aircs [AIAA 79-0845]	A79-32919 A79-325810 oupled pt N79-22051cs on A79-32299 N79-2326 s of canards N79-23011 turbine A79-32441 by means
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRANE, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or otational-polarization elements situated surface of revolution KLOSTER, M. A special extension of the General Point Performance Equation KMEAFSEY, J. T. An economic model of the manufacturers' aircomproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demandation of air transportation [NASA-CR-152191] KOBAYAKAWA, M. Lifting surface approach to the estimation of response of finite wings KOREMATSU, K. Performance estimation of partial admission of laster paper 79-GT-123] KOST, FH. Shock boundary layer interaction on high turn transpoint turbine cascades	# 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. EXPERIMENTAL Studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral (NASA-TP-1427) B, A. D. A design review of ceramic components for engines [ASME PAPER 79-GT-183] G-LENDORFP, G. Designing, calculating, and manufacturing of data processing GE, R. H. Large wing-in-ground effect transport aircit [AIAA 79-0845] KFORD, H. E.	A79-32919 A79-325810 oupled pt N79-22051cs on A79-32291 N79-2326 s of canards N79-23011 turbine A79-32441 by means A79-32751 raft A79-33830
Catalytic combustion for gas turbine applicate [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or rotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KWEAPSEY, J. T. An economic model of the manufacturers' aircri production and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the dema for air transportation [NASA-CR-152191] KOBAYAKAWA, H. Lifting surface approach to the estimation of response of finite wings KOREMATSU, K. Performance estimation of partial admission to [ASME PAPER 79-GT-123] KOST, PH. Shock boundary layer interaction on high turr transpoint turbine cascades	# 1	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swey wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of the configuration with and without integral of the configuration with and without integral of the configuration with and manufacturing of data processing GE, R. B. Large wing-in-ground effect transport airc: [AIAA 79-0845] KFORD, H. E. Definition of requirements for a performance	A79-32919 A79-3258 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23019 turbine A79-3244 by means A79-3275 raft A79-33830 ce
Catalytic combustion for gas turbine applicat [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array contational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KNEAFSEY, J. T. An economic model of the manufacturers' aircomproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demander of the surface approach to the estimation of response of finite wings KOREMATSU, K. Performance estimation of partial admission of [ASME PAPER 79-GT-123] KOST, FH. Shock boundary layer interaction on high turn transponic turbine cascades	tions 179-32447 wind 79-23125 LABS 79-34314 of 79-32734 LAPS 79-35926 LABS 79-22064 and LABS 79-24596 LABS 79-32392 LABS 79-32392 LABS 79-32392 LABS 79-32342	NICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors RANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] E, A. D. A design review of ceramic components for engines [ASME PAPER 79-GT-183] G-IENDORPP, G. Designing, calculating, and manufacturing of data processing GE, R. B. Large wing-in-ground effect transport airci [AIAA 79-0845] KYOND, H. E. Definition of requirements for a performance measurement system for C-5 aircrew member [AD-A063282]	A79-32919 A79-3258 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23019 turbine A79-3244 by means A79-3275 raft A79-33830 ce
Catalytic combustion for gas turbine applicate [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or cotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KMEAPSEY, J. T. An economic model of the manufacturers aircriproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demandary of the students of the	tions 79-32447	NICEWICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swey wings. Volume 1: General trends [AD-A063819] OW, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors Wand tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B. H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of the configuration with and without integral of the configuration with and without integral of the configuration with and mithout integral of the configuration of ceramic components for engines [ASME PAPER 79-GT-183] G-IENDORFF, G. Designing, calculating, and manufacturing of data processing GE, R. B. Large wing-in-ground effect transport aircit [AIAA 79-0845] KYORD, H. E. Definition of requirements for a performance measurement system for C-5 aircrew member [AD-A063282] SEB, T. R.	A79-32919 A79-3258 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23011 turbine A79-3244 by means A79-3275 raft A79-33831 ce
Catalytic combustion for gas turbine applicate [ASME PAPER 79-GT-188] KIRRAME, P. P. The effect of blockage in shear flow in the stunnel [BU-221] [BU-221] KLEWE, R. C. Preliminary studies using photon correlation velocimetry in turbomachinery and combustic systems KLIMASHOV, A. A. Radiation field of a conformal phased array or cotational-polarization elements situated of surface of revolution KLOSTER, H. A special extension of the General Point Performance Equation KMEAPSEY, J. T. An economic model of the manufacturers aircriproduction and airline earnings potential, volume 3 [NASA-CR-152158] The impact of changing technology on the demandary of the students of the	tions 79-32447	BICENICZ, T. Dynamic stability of a flight vehicle laying an uncoiling line UC, T. The powered glider, SZD-45A Ogar EY, D. W. Aerodynamic characteristics of the close-occanard as applied to low-to-moderate swell wings. Volume 1: General trends [AD-A063819] ON, P. Experimental studies of unsteady aerodynamic wind tunnel models of helicopter rotors BANCE, P. Performance of a TAP-2 hydrofoil [AD-A065102] B, H. Aerodynamic characteristics at Mach number: 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral (NASA-TP-1427) B, A. D. A design review of ceramic components for engines [ASME PAPER 79-GT-183] G-LENDORFP, G. Designing, calculating, and manufacturing of data processing GE, R. H. Large wing-in-ground effect transport aircit (AIAA 79-0845) KFORD, H. E. Definition of requirements for a performance measurement system for C-5 aircrew member (AD-A063282)	A79-32919 A79-3258 oupled pt N79-2205 ics on A79-32299 N79-2326 s of canards N79-23011 turbine A79-3244 by means A79-3275 raft A79-33831 ce

PERSONAL AUTHOR INDEX BALEFAKIS, J.

*1 <i>c</i> h=1	7001P 3 F
LASCHKA, B.	LOGAH, A. H. Evaluation of an energy distribution system for
Aerodynamic characteristics of a fighter-type configuration during and beyond stall	helicopter landing gears during hard landing
N79-22003	[AD-A065298] N79-23069
LATYPOV, A. P.	LOISBAU, B.
Optimization of hypersonic three-dimensional shapes	Study of compressor aeroelastic instabilities in a
A79-35584	linear cascade wind tunnel
LAWRENCE, R. S.	[ONERA, TP NO. 1979-6] A79-32296
Error model verification for a three axis laser gyro strapdown inertial measurement unit	LOPEZ, H. L. Aerodynamics and performance characteristics of
[AD-A064047] N79-22072	wing lift augmentation schemes
LAYTOR, J. P.	H79-23006
Advanced nuclear systems for large aircraft	LORDI, J. A.
[AIAA 79-0852] A79-33835	Three-dimensional lifting-surface theory for an
LEATHERWOOD, J. D.	annular blade row
Physical and subjective studies of aircraft	[ASE PAPER 79-GT-182] A79-32441
interior noise and vibration [NASA-TM-80084] N79-23754	LOTTER, K. W.
[NASA-TH-80084] N79-23754 LECONTE, P.	Intake design and intake/airframe integration for a post-stall fighter aircraft concept
Adaptation for the economy or adaptation for	N79-22027
energy conservation	LUCAS, J. J.
[AAAF-NT-77-23] N79-23537	Fewer controls, easier inspection - Diffusion
LEDY, J. P.	bonding shows cost advantages
Aerodynamic characteristics of a fighter-type	A79-33591
configuration during and beyond stall	LUDWIG, G. R.
N79-22003 LEE-BECHTOLD, S.	Wind tunnel model study of the hot exhaust plume from the compressor research facility at
Thermodynamics of organic compounds	Wright-Patterson Air Force Base, Ohio
[AD-A065664] N79-23232	[ASME PAPER 79-GT-186] A79-32445
LRE, D.	LUBRS, J.
Study of blade aspect ratio on a compressor front	Prost formation on an airfoil: A mathematical
stage aerodynamic and mechanical design report	model 1
[NASA-CR-159555] N79-23085	[NASA-CR-3129] N79-22706
LBE, D. J.	LUKASHBVICH, A. B.
Some observations on the local instability of orthotropic structural sections	Parameters of three-dimensional flow past a wing near the free surface of a ponderable fluid
A79-33461	179-35155
LEE, D. R.	LUPSON, J.
Advanced Simulator for Pilot Training (ASPT):	Four jets for short-haul work Bhe 146
Aerial refueling visual simulation-engineering	A79-34922
[AD-A063283] N79-22118	LUSB, P. A.
LEE, J. B.	Aerodynamic noise theory
A design review of ceramic components for turbine	N79-23378
engines [ASME PAPER 79-GT-183] A79-32442	Jet noise: A status report N79-23379
	117 23313
•	LYNNBORTH . L. C.
LEE, W. H.	LYNNWORTH, L. C. Advanced technology fuel mass flowmeter
•	LYNNWORTH, L. C. Advanced technology fuel mass flowmeter [AD-A063963] N79-22108
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099	Advanced technology fuel mass flowmeter
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVEE, A. H.	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVEE, A. H. Ignition of fuel sprays by hot surfaces and	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108 M HACCALLUB, B. R. L.
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MNAC) method for flight control systems [NASA-CR-3089] LEFEBVEE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108 M HACCALLUB, B. R. L. Thermal influences in gas turbine transients -
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LPERBVBE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G.	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108 MACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MNAC) method for flight control systems [NASA-CR-3089] LEFEBVEE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine	Advanced technology fuel mass flowmeter [AD-A063963] N79-22108 MACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MNAC) method for flight control systems [NASA-CR-3089] LEFEBVEE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, B. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] BACH, K. D. Improving turbine efficiency
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENINIGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] LEPEETEE, M.	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUE, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 HACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEFRETRE, M. Two dimensional anemometric probe	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **MACHARD AND AND AND AND AND AND AND AND AND AN
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPERVER, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] LEPERTER, H. Two dimensional anemometric probe [AAAF-NT-78-09] N79-23116	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, M. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 **MACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436 **BADDOX, A. B.* In-flight captive store loads compared with
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEFRETRE, M. Two dimensional anemometric probe	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **MACHARD AND AND AND AND AND AND AND AND AND AN
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEBININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] LEPEETRE, M. Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A.	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPBEVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] LEPRETRE, M. Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIAND, F.	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 BABDA, H. Lifting surface approach to the estimation of gust
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LETEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] LETERETRE, M. Two dimensional anemometric probe [AAAF-NT-78-09] LEVIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Fatigue of helicopters: Service life evaluation	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409** **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436** **BADDOX, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595** **BABDA, H.* Lifting surface approach to the estimation of gust response of finite wings
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVBE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TH-79145] N79-23257 LEPEBTER, H. Two dimensional anemometric probe [AAAP-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIAND, P. Fatigue of helicopters: Service life evaluation method	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409** **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436** **HADDOX, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595** **BABDA, H.* Lifting surface approach to the estimation of gust response of finite wings **A79-34596**
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVBE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] LEPRETBE, H. Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIAND, F. Fatigue of helicopters: Service life evaluation method N79-23079	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASMF PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 BABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGHAN, G.
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LETEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] LETEBERE, M. Two dimensional anemometric probe [AAMF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H.	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409** **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436** **ANDOOI, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595** **BABDA, B.* Lifting surface approach to the estimation of gust response of finite wings **A79-34596** **BAIGHAN, G.* Geodesý and coordinate conversion for position
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVER, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TH-79145] N79-23257 LEPEBTER, H. Two dimensional anemometric probe [AAAP-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Patigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409** **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436** **ADDOX, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595** **BABDA, H.* Lifting surface approach to the estimation of gust response of finite wings **A79-34596** **BAIGHAN, G.* Geodesy and coordinate conversion for position determination of aircraft**
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LETEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] LETEBERE, M. Two dimensional anemometric probe [AAMF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H.	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 BABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGHAN, G. Geodesy and coordinate conversion for position determination of aircraft
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVEE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] N79-23257 LEPRETEE, B. Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIAND, P. Patigue of helicopter's: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409** **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436** **ADDOX, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595** **BABDA, H.* Lifting surface approach to the estimation of gust response of finite wings **A79-34596** **BAIGHAN, G.* Geodesy and coordinate conversion for position determination of aircraft**
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVEE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] N79-23257 LEPRETEE, H. Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, P. Patigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine blades	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASMF PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOY, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 HABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGHAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 HAIHE, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEETRE, M. Two dimensional anemometric probe [AAAP-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIAND, F. Patigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine blades	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.* Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409 **BACH, K. D.* Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436 **HADDOX, A. R.* In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595 **BAEDA, H.* Lifting surface approach to the estimation of gust response of finite wings **A79-34596 **BAIGNAN, G.* Geodesy and coordinate conversion for position determination of aircraft **A79-32581** **MAINE, R. R.* Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] **N79-22113**
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVBE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEBTBE, H. Two dimensional anemometric probe [AAAP-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Patigue of helicopters: Service life evaluation method N79-23079 LIBBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIBDOW, E. S.	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, N. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 MACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 MADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 BABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGNAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 MAIHE, R. B. Important factors in the maximum likelihood analysis of flight test maneuvers [MASA-TP-1459] MARHEREKO, IU. IU.
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVRE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] N79-23257 LEPRETRE, B. Two dimensional anemometric probe [AAAF-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIAND, F. Patigue of helicopter's: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine blades N79-22090 LIBDOW, E. S. Systems approach to life-cycle design of	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASMF PAPER 79-GT-143] HACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 HABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 HAIGHAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 HAINE, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] HAKHHENKO, IU. IU. Optimal excitation of amplitude-direction-finder
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. H. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEETRE, H. Two dimensional anemometric probe [AAAP-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIARD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIMDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, M. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 MACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 MADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 MAEDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGNAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 MAINER, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] NARHHERKO, IU. IU. Optimal excitation of amplitude-direction-finder antennas operating on the basis of the
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEFEBVRE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LEININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TM-79145] N79-23257 LEPRETRE, B. Two dimensional anemometric probe [AAAF-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIAND, F. Patigue of helicopter's: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine blades N79-22090 LIBDOW, E. S. Systems approach to life-cycle design of	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASMF PAPER 79-GT-143] A79-32409 BACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOY, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 BABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 BAIGHAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 HAIHE, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] MAKHHENKO, IU. IU. Optimal excitation of amplitude-direction-finder
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENNINGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEETRE, M. Two dimensional anemometric probe [AAAP-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIARD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIMDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] N79-23260 LISEIKIB, V. D. On some methods for the numerical simulation of	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, N. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 MACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 MADDOI, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 MABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 MAIGNAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 MAIHE, R. R. Important factors in the maximum likelibood analysis of flight test maneuvers [NSSA-TP-1459] MAKHHBHKO, IU. IU. Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] LEPEBVBE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] LEININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TR-79145] Two dimensional anemometric probe [AAAF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Patigue of helicopters: Service life evaluation method N79-23079 LIBBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine Flades N79-22090 LIBDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] LISEIKIN, V. D. On some methods for the numerical simulation of flows with complex structure	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, N. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 MACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 MADDOI, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 MABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 MAIGNAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 MAIHE, R. R. Important factors in the maximum likelibood analysis of flight test maneuvers [NSSA-TP-1459] MAKHHBHKO, IU. IU. Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method A79-35502 BALARREY, C. Light propeller aircraft noise
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVBE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engane [NASA-TH-79145] N79-23257 LEPRETBE, M. Two dimensional anemometric probe [AAMF-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIAND, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine blades N79-22090 LIBDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] LISEIKIN, V. D. On some methods for the numerical simulation of flows with complex structure	Advanced technology fuel mass flowmeter [AD-A063963] M HACCALLUB, H. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASMF PAPER 79-GT-143] HACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 HADDOX, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 HABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 HAIGHAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 HAIHE, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] HAKHHENKO, IU. IU. Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method A79-35502 HALARHEY, C. Light propeller aircraft noise
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEETRE, M. Two dimensional anemometric probe [AAAP-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIRD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIDDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] N79-23260 LISEIKIN, V. D. On some methods for the numerical simulation of flows with complex structure A79-34691 LIU, H. C.	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.** Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409 **BACH, K. D.** Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436 **BADDOX, A. R.** In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595 **BAEDA, H.** Lifting surface approach to the estimation of gust response of finite wings **A79-34596 **BAIGNAN, G.** Geodesy and coordinate conversion for position determination of aircraft **A79-32581* **MAINER, R. R.** Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] **NASA-TP-1459] **NASA-TP-1459] **PARENERNO, IU. IU.** Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method **A79-34980* **BALARBEY, C.** Light propeller aircraft noise **A79-34980** **BALARBEY, C.** Light propeller aircraft noise
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVBE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] Two dimensional anemometric probe [AAAF-NT-78-09] N79-23116 LEWIS, R. A. Electromechanical actuation development [AD-A065734] LIARD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIBBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIBDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] LISEIKIN, V. D. On some methods for the numerical simulation of flows with complex structure A79-34691 LIU, H. C. An application of 3-D viscous flow analysis to the	Advanced technology fuel mass flowmeter [AD-A063963] M MACCALLUB, N. R. L. Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] A79-32409 MACH, K. D. Improving turbine efficiency [ASME PAPER 79-GT-176] A79-32436 MADDOI, A. R. In-flight captive store loads compared with wind-tunnel and mathematical simulations A79-34595 MABDA, H. Lifting surface approach to the estimation of gust response of finite wings A79-34596 MAIGMAN, G. Geodesy and coordinate conversion for position determination of aircraft A79-32581 MAIHE, R. R. Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] MARHHEHKO, IU. IU. Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method A79-35502 BALABREY, C. Light propeller aircraft noise A79-34980 MALEFAKIS, J. Intake design and intake/airframe integration for
LEE, W. H. Investigation of the Multiple Method Adaptive Control (MMAC) method for flight control systems [NASA-CR-3089] N79-23099 LEPEBVRE, A. B. Ignition of fuel sprays by hot surfaces and stabilization of aircraft fires [AD-A065153] N79-23181 LENININGER, G. Identification and dual adaptive control of a turbojet engine [NASA-TM-79145] N79-23257 LEPEETRE, M. Two dimensional anemometric probe [AAAP-NT-78-09] LEWIS, R. A. Electromechanical actuation development [AD-A065734] N79-23101 LIRD, F. Fatigue of helicopters: Service life evaluation method N79-23079 LIEBERT, C. H. Tests of NASA ceramic thermal barrier coating for gas-turbine engines A79-34996 LIESS, C. Introduction to cooling of gas turbine flades N79-22090 LIDDOW, E. S. Systems approach to life-cycle design of pavements. Volume 3: LIFE2 program listing [AD-A064698] N79-23260 LISEIKIN, V. D. On some methods for the numerical simulation of flows with complex structure A79-34691 LIU, H. C.	Advanced technology fuel mass flowmeter [AD-A063963] M **MACCALLUB, N. R. L.** Thermal influences in gas turbine transients - Effects of changes in compressor characteristics [ASME PAPER 79-GT-143] **A79-32409 **BACH, K. D.** Improving turbine efficiency [ASME PAPER 79-GT-176] **A79-32436 **BADDOX, A. R.** In-flight captive store loads compared with wind-tunnel and mathematical simulations **A79-34595 **BAEDA, H.** Lifting surface approach to the estimation of gust response of finite wings **A79-34596 **BAIGNAN, G.** Geodesy and coordinate conversion for position determination of aircraft **A79-32581* **MAINER, R. R.** Important factors in the maximum likelihood analysis of flight test maneuvers [NASA-TP-1459] **NASA-TP-1459] **NASA-TP-1459] **PARENERNO, IU. IU.** Optimal excitation of amplitude-direction-finder antennas operating on the basis of the comparison method **A79-34980* **BALARBEY, C.** Light propeller aircraft noise **A79-34980** **BALARBEY, C.** Light propeller aircraft noise

Buffeting measurements in flight and in a	wind	MCLEOD, S. A. Design, fabrication, and evaluation of GATO	
tunnel [AAAF-NT-78-17]	N79-23104	(trade name) ceramic-wrought alloy attach concepts	
HANGOLD, V. L. Lightning transient research on an P-111E		HCLOUGHLIN, V. C. R.	N79-22102
[AD-A063765] HABS, L. G. J.	N79-22066	An evaluation of coatings for steel and tit alloy fasteners for aircraft applications	3
Measurement of ozone in an aircraft	A79-34925	MEBBER, R. I.	N79-23242
HAQUENBEAR, B.		Advanced Simulator for Pilot Training (ASPI	
Study of compressor aeroelastic instabili linear cascade wind tunnel	ties in a	Aerial refueling visual simulation-engine [AD-A063283]	N79-22118
[ONERA, TP NO. 1979-6] HARBSCA, C.	A79-32296	MELLOR, A. H. Characteristic time correlations of polluta	nt.
Unsteady effects on a stalled wing in pul		emissions from an annular gas turbine com	bustor
- Comparison with back-and-forth oscill	A79-32288	[ASHE PAPER 79-GT-194] BEBARD, M.	A79-32452
MARIN, N. P. Radiation field of a conformal phased arr	av ∩f	Hydraulic compressor for a wind tunnel	N79-23107
rotational-polarization elements situat		BENDENHALL, N. B.	
surface of revolution	A79-32734	Prediction of lateral aerodynamic loads on aircraft at high angles of attack	
MARKS, K. B. An appraisal of models used in life cycle	cost	MERRILL, W.	N79-22024
estimation for USAF aircraft systems		Identification and dual adaptive control of	a
[AD-A064333] HARTIN, G. L.	N79-22964	turbojet engine [NASA-TM-79145]	N79-23257
Aerodynamic design and analysis of the AS		BBURZEC, JL. Dynamic identification of light aircraft	
supersonic transport configuration conc [NASA-CR-159051]	N79-22046	structures and flutter certification	
MARYNIAK, J. Dynamic stability of a flight vehicle lay	ing out	[ONERA, TP NO. 1979-31] BEYER, L. J.	A79-32302
an uncoiling line	•	A design review of ceramic components for t	urbine
HASSEY, E. G.	A79-32919	engines [ASME PAPER 79-GT-183]	A79-32442
An appraisal of models used in life cycle estimation for USAF aircraft systems	cost	MICCICHE, J. T. U.S. Navy developments in crashworthy seati	nσ
[AD-A064333]	N79-22964		A79-33623
MATSUKI, N. Oil squeeze film dampers for reducing vib.	ration of	Nonlinear stochastic control design for gas	;
aircraft gas turbine engines [ASME PAPER 79-GT-133]	A79-32402	turbine engines [AD-A065075]	N79-22103
HATTASITS, G. R.		BICHALKE, A.	, 12.105
In-flight captive store loads compared wi wind-tunnel and mathematical simulation		Relation between static and in-flight directivities of jet noise	
HATVERY, V. V.	A79-34595	MICHEL, R.	A79-34585
Damping capacity of paired shrouded turbi		Effects of flow turbulence and noise on	
in relation to shroud contact condition	s 179-32827	aerodynamic phenomena and measured quanti	N79-23109
MAYER, N. J. Large lighter-than-air vehicles		MICHRL, U. Relation between static and in-flight	
[AIAA 79-0847]	A79-33831	directivities of jet noise	170 34505
MAYLE, R. E. An experimental study of endwall and airf	011	MIGNEAULT, G. B.	A79-34585
surface heat transfer in a large scale		D-10-413 401-04-1-41-0	
	turbine	Evaluation applied to reliability analysis reconfigurable, highly reliable, fault-to	
blade cascade [ASME PAPER 79-GT-99]	A79-32375	reconfigurable, highly reliable, fault-to computing systems	lerant,
blade cascade	A79-3237 5	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A.	lerant, N79-22783
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock	A79-32375	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow	lerant, N79-22783
blade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges	A79-32375	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel	lerant, N79-22783
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance:	A79-32375 tbe k waves A79-35110	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in heigh	N79-22783 IS IN A A79-32290 At control
blade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment	A79-32375 tbe k waves A79-35110	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in heigh	N79-22783 IS 11 a N79-32290
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S.	A79-32375 the k waves A79-35110 Fall 7879-23061	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel MIHARA, S. The role of the backside parameter in heigh BILLEB, D. S. Aerodynamic characteristics at Mach numbers	N79-22783 s in a A79-32290 c control A79-34522
blade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91]	A79-32375 the k waves A79-35110 Fall 7879-23061	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in heigh BILLER, D. S.	N79-22783 s in a A79-32290 st control A79-34522 s of
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B.	A79-32375 the k waves A79-35110 Fall 'N79-23061 bines	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel HIHARA, S. The role of the backside parameter in heigh HILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427]	N79-22783 s in a A79-32290 st control A79-34522 s of
blade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000	A79-32375 the k waves A79-35110 Fall 'N79-23061 bines	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in height BILLEB, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] BILLEB, P. L. RPV electric power system study. Phase 2:	N79-22783 IS 1N a A79-32290 At control A79-34522 B of Canards N79-23013
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B.	A79-32375 the k waves A79-35110 Fall N79-23061 blues A79-32368 A79-33622	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in heigh BILLBR, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] BILLBR, P. L. RPV electric power system study. Phase 2: bench mockup development	N79-22783 IS 1N a A79-32290 At control A79-34522 B of Canards N79-23013
blade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZGUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000 MCGUWIGLE, R. D. Applicability of fiber optics to aircraft detection systems	A79-32375 the k waves A79-35110 Fall TN79-23061 bines A79-32368 A79-33622 fire	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BIHARA, S. The role of the backside parameter in heighth of the role of the r	N79-22110
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000 MCGUBIGLE, R. D. Applicability of fiber optics to aircraft detection systems [AD-A063974] MCHUGR, J.	A79-32375 the k waves A79-35110 Fall N79-23061 bines A79-32368 A79-33622 fire N79-22882	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel MIHARA, S. The role of the backside parameter in heigh MILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] MILLER, P. L. RPV electric power system study. Phase 2: bench mockup development [AD-A065008] MILLER, R. H. Definition of requirements for a performance measurement system for C-5 aircrev member	N79-22783 S in a A79-32290 At control A79-34522 S of Canards N79-23013 Hot N79-22110
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZANY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDUBALD, A. B. Ejection systems in the year 2000 MCGUBIGLE, R. D. Applicability of fiber optics to aircraft detection systems [AD-A063974] MCHUGGN, J. Advanced Simulator for Pilot Training (AS	A79-32375 the waves A79-35110 Fall 'N79-23061 bines A79-32368 A79-33622 fire N79-22882 PT):	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel HIHARA, S. The role of the backside parameter in heigh MILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] MILLER, P. L. RPV electric power system study. Phase 2: bench mockup development [AD-8065008] MILLER, B. H. Definition of requirements for a performance measurement system for C-5 aircrew member	N79-22783 S in a A79-32290 At control A79-34522 S of Canards N79-23013 Bot N79-22110
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000 MCGUBIGLE, R. D. Applicability of fiber optics to aircraft detection systems [AD-A063974] MCHUGR, J. Advanced simulator for Pilot Training (AS Aerial refueling visual simulation-enging and a simulation and a simulation-enging and a simulation and a simulation-enging and a simulation and a simulation and a simulation-enging and a simulation and a simula	A79-32375 the waves A79-35110 Fall 'N79-23061 bines A79-32368 A79-33622 fire N79-22882 PT):	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel HIHARA, S. The role of the backside parameter in heigh MILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] HILLER, P. L. RPV electric power system study. Phase 2: bench mockup development [AD-A065008] MILLER, B. H. Definition of requirements for a performance measurement system for C-5 aircrew member [AD-A063282] HIHKOVICH, B. H. Optimal excitation of amplitude-direction-ference in the strength of the system of th	N79-22119
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZAWY, R. S. Surge-induced structural loads in gas tur [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000 MCGUBIGLE, R. D. Applicability of fiber optics to aircraft detection systems [AD-A063974] MCHUGR, J. Advanced Simulator for Pilot Training (AS Aerial refueling visual simulation-enging and A063283] MCLEAN, J. D. Computer program to calculate three-dimensions.	A79-32375 the k waves A79-35110 Fall TN79-23061 bines A79-32368 A79-32368 A79-32368 A79-22882 pt): neering N79-22118 sional	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] BILLER, P. L. RPV electric power system study. Phase 2: bench mockup development [AD-A065008] BILLER, B. H. Definition of requirements for a performance measurement system for C-5 aircrew member [AD-A063282] BIRKOVICH, B. H. Optimal excitation of amplitude-direction-fantennas operating on the basis of the comparison method	N79-22119 inder
hlade cascade [ASME PAPER 79-GT-99] MAZHUL, I. I. Investigation of the regimes of flow past upper surfaces of delta wings with shock separated from the leading edges MAZOUR, T. J. Analysis of visual detection performance: 1978 experiment [AD-A065118] MAZZHY, R. S. Surge-induced structural loads in gas ture [ASME PAPER 79-GT-91] MCDOBALD, A. B. Ejection systems in the year 2000 MCGUBIGLE, R. D. Applicability of fiber optics to aircraft detection systems [AD-A063974] MCHUGH, J. Advanced Simulator for Pilot Training (ASMerial refueling visual simulation-enging AD-A063283] MCLEAN, J. D.	A79-32375 the k waves A79-35110 Fall TN79-23061 bines A79-32368 A79-32368 A79-32368 A79-22882 pt): neering N79-22118 sional	reconfigurable, highly reliable, fault-to computing systems [NASA-TM-80090] BIGHOSI, A. Implementation of unsteady oscillatory flow transonic wind tunnel BILLER, D. S. Aerodynamic characteristics at Mach numbers 1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral of [NASA-TP-1427] BILLER, P. L. RPV electric power system study. Phase 2: bench mockup development [AD-A065008] BILLER, B. H. Definition of requirements for a performance measurement system for C-5 aircrew member [AD-A063282] BIRKOVICH, B. H. Optimal excitation of amplitude-direction-fantennas operating on the basis of the comparison method	N79-22119

N79-22007

HITCHELL, B.		N	
CPR Wehicle design and performance object	179-33612		
HITRIOU, V. G.		BAEGELI, D. W.	
The electro-impulse de-icing method [BU-227]	N79-23073	Puel property effects on combustor perform [ASME PAPER 79-GT-178]	ance A79-32438
HIYACHI, T.	117 23073	HAGAYAHA, T.	E// 32430
Oil squeeze film dampers for reducing vil	ration of	Numerical analysis of flow through turbine	
aircraft gas turbine engines [ASME PAPEE 79-GT-133]	A79-32402	cascades by the Modified FLIC Method	A79-32590
MITATA, E.	175 32402	BAKABORA, B.	n,, 323,0
Numerical analysis of flow through turbin cascades by the Modified FLIC Method	ne	The role of the backside parameter in heig	ht control A79-34522
	A79-32590	HARAYAHA, T.	
HOCK, B. A.	fan	Experimental study on diffusers for mixed-	flow
Closed Brayton cycle system optimization undersea, terrestrial, and space applic		machines [ASME PAPER 78-GT-120] BAHGIA, R. K.	A79-32936
MOR, P. J.	117 22030	On slender wings with leading edge camber	
Flight evaluation BK 2 integrated control	ller		N79-22032
installed in an OH-58A helicopter [AD-A065072]	N79-23103	NEBETH, Z. H. Operating characteristics of a cantilever-	monnted
HOKELKE, H.	473 23103	resilient-pad gas-lubricated thrust bear	
The prediction of steady, circumferential		[NASA-TP-1438]	N79-22518
and temperature distortions in multista flow compressors	ige axial	MRUBOLD, S. P. An investigation into the pressure distrib	ntions
[ASME PAPER 79-GT-184]	A79-32443	over a wing and store combination at low	
HONROE, E. G.		[BU-226]	N79-23047
Advanced Simulator for Pilot Training (AS Aerial refueling visual simulation-engi		NEWTOH, P. C. Strategic airlift vehicle concepts	
[AD-A063283]	₹79-22118	[AIAA 79-0850]	A79-33833
HONTGOMERY, T. D.		HIED, B. A.	
Important factors in the maximum likeliho	ood	Modal analysis of gas turbine buckets using	ga
analysis of flight test maneuvers [NASA-TP-1459]	N79-22113	digital test system [ASME PAPER 79-GT-124]	A79-32393
MOORE, J. E., JR.		NIESSBH, P. R.	
A computational scheme for structural inf	luence	Filtering technique based on high-frequency	y plant
coefficients of certain planar wings	A79-34597	modeling for high-gain control [NASA-CASE-LAR-12215-1]	N79-23097
MOORE, J. W.		BIROLITSCH, D.	2003.
Large wing-in-ground effect transport air		Normal force and pitching moment of wing-be	
[AIAA 79-0845] MOORE, W. A.	A79-33830	combinations in the monlinear angle-of-a- range at subsonic speeds	ttack
Porebody/wing wortex interactions and the	eir	y	N79-22022
influence on departure and spin resista		HOOHAM, R. W.	-4
MORDUCH, G. E.	ห79-22001	Experimental investigation of three helicor rotor airfoils designed analytically	pter
User's guide to data preparation: Photog	rammetric	[NASA-TP-1396]	N79-22037
navigation analysis program Potonap	W70 2222	HORSHORTHY, K. H.	
[AD-A064614] Kalman filtering and smoothing in Fotona	N79-22070	A new high product rate 10 nanosecond, 256 correlator	borne
orbit determination using GPS measureme	ents		A79-34305
[AD-A064613]	N79-22071		
MORGAN, T. E., JR. Beacon-based collision avoidance system -		0	
Experimental results		OCH, P.	
Nony bun D V	A79-33606	Fatigue life estimation methods for helicop	pter
MORLAND, D. V. System description: Aviation Wide-Angle	Visual	structural parts	N79-23077
System (AWAVS) Computer Image Generator		OBSTERLIN, W.	
visual system [AD-A065060]	N79-23683	A flyable suspended model helicopter for the investigation of the human pilot behavior	
HORRELL, P. S.	1177 23003	investigation of the human pixot behavior	A79-35923
Airline productivity redefined - An analy	sis of	OGI, S.	_
U.S. and European carriers	A79-35100	Standard Avionics Hodules (SAH) for existing [AD-A065629]	ng modems N79-23083
MORRIS, P. J.	175 33100	OKUBO, H.	877 25005
The generation, radiation and prediction		Lifting surface approach to the estimation	of gust
supersonic jet noise. Volume 2, append Computer program listing	lıx:	response of finite wings	A79-34596
[AD-A064685]	N79-22854	OPDYKE, G., JR.	B75-34350
HORRIS, S. J., JR.		The effect of a sample lot of fuel JECTORS	on
Performance estimation for a highly loade		emissions levels of a small gas turbine	A79-32427
eight-blade propeller combined with an technology turboshaft engine	auvanceu	[ASME PAPER 79-GT-165] ORLIK-RUBCKEMANN, K. J.	879-32427
[NASA-TM-80075]	N79-22101	Effect of high angles of attack on dynamic	
BOSES, C. A. Fuel property effects on combustor perfor	mance	stability parameters	ห79-21997
[ASME PAPER 79-GT-178]	A79-32438	ORMAN, J. C.	113-21331
MOSS, G. P.		A comparison of costs associated with local	1
Some UK research studies of the use of wi		actions to reduce aircraft noise impacts	A79-34973
strakes on combat aircraft configuration high angles of attack	us at	OSBORB, A. G.	a/3-343/3
÷ .	N79-21999	Thermodynamics of organic compounds	
MULLOY, J. H.	go.ono.t==	[AD-A065664]	N79-23232
Aerodynamic design of fixed and variable nozzleless turbine casings	уеошетту	OSBEE, S. R. Analysis of visual detection performance:	Fall
[ASME PAPER GT-87]	A79-32364	1978 experiment	
	1	(AD-A065118)	N79-23061

	PLETIE, E.
P	Afterbody tests in the Modane hot gas bench
PAMADI, B. N.	[AAAF-NT-78-10] N79-23095 PLUMER, J. R.
An exploratory investigation of quasi-free flying models in a supersonic short-duration wind tunnel	Copter windshields made tougher - Special coating extends life, adds safety
NO 5 P	POCIBRI, L. A79-33588
PAO, S. P. A correlation of mixing noise from coannular jets	An assessment of local risk -
with inverted flow profiles	N79-22207
[NASA-TP-1301] N79-22849 PAPAILIOU, K.	POISSOM-QUINTON, P. Aerodynamic characteristics of a fighter-type
Aerodynamic problems in cooled turbine blading	configuration during and beyond stall
design for small gas turbine	N79-22003
N79-22091	Special Ground testing facilities and testing techniques for STOL aircraft
Engine evaluation of a vibration damping treatment	N79-23007
for inlet guide vanes [ASME PAPER 79-GT-163] A79-32425	PORTER, R. F. Extended analytical study of the
PASQUET, G. A.	free-wing/free-trimmer concept
Analyzing technology potential for strategic airlift	[NASA-CR-3135] N79-22040
[AIAA 79-0841] A79-33828 PATTOE, J. H., JR.	POSELEVICE, V. A. Effect of friction on motion of a piston driven by
Flight investigation of piloting techniques and	combustion products
crosswind limitations using a research type	NDBCIPT 7 7
crosswind landing gear [NASA-TP-1423] N79-23012	PRESLEY, L. L. High angle of incidence implications upon air
PAUL, D. B.	intake design and location for supersonic cruise
Engine evaluation of a vibration damping treatment for inlet guide vanes	aircraft and highly maneuverable transonic aircraft
[ASME PAPER 79-GT-163] A79-32425	N79-22026
PEACOCK, R. E.	PRESLEY, B. W.
A general solution for distorted flows in cascades of aerofoils	Advanced flight control actuation system (AFCAS-E/P): Peasibility investigation of an
[ASHE PAPER 79-GT-65] A79-32353	electro/pneumatic dual power driven concept
PEDERSEB, N. E. Advanced technology fuel mass flowmeter	[AD-A063992] N79-22114 PRIDE, R. A.
[AD-A063963] N79-22108	Carbon fibers and composites
PENDLEY, R. E.	N79-22199 End-to-end testing
Quieter short and medium haul aircraft A79-34921	N79-22204
PERIAUX, J.	PRIVOZHIK, B. J.
Visualisations and calculations of air intakes at high angles of attack and low Reynolds number	The growth and evolution of the TPE331 [ASME PAPER 79-GT-164] A79-32426
N79-22030	PRYCE, A. W.
PERINI, J. Study of PARC nouport antonna tost range. Methods	European scientific notes, volume 32, number 5 [AD-A065400] N79-23885
Study of RADC newport antenna test range: Methods of reflection reductions and increased frequency	PUGH, P. G.
coverage	The design of models and their supports, the Evans
	clean-flow tunnel. A review of some of the
[AD-A065151] N79-23331 PRRKINS. S. C., JR.	
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on	various proposals N79-23110
PERKINS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack	various proposals N79-23110 PUZYERV, V. A.
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on	various proposals N79-23110
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIBSKI, J. Designing aircraft shock absorbers	<pre>various proposals</pre>
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIBSKI, J.	<pre>various proposals</pre>
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C.
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIESKI, J. Designing aircraft shock absorbers A79-32585 PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers A79-32585 PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ.	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C.
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIESKI, J. Designing aircraft shock absorbers A79-32585 PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers A79-32585 PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295	PUZYRBY, V. A. Radio-engineering tracking systems A79-35501 Q QUERARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLINSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G.	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z.
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers A79-32585 PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295	PUZYRBY, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302	Various proposals PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZYNSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] PICO, L.	Various proposals PUZIREV, V. A. Radio-engineering tracking systems A79-35501 Q QUERARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification (ONERA, TP NC. 1979-31) A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development	PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUBHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] N79-22110	PUZIRBY, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft A79-33636
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification (ONERA, TP NC. 1979-31) A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear BI-Brayton system for aircraft propulsion	PUZYREV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft A79-33636 RAMSDEB, J. H. Aircraft glassmaker
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASHE PAPER 79-GT-119] A79-32389	PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUBHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAHSDRB, J. M. Aircraft glassmaker
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification (ONERA, TP NC. 1979-31) A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear B1-Brayton system for aircraft propulsion [ASME PAPER 79-GT-119] PIERCO, G. Modernization of the low speed wind tunnel at	PUZYREV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAMSDEM, J. M. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer program to calculate three-dimensional
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPEB 79-GT-119] A79-32389 PIERBON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization	PUZYRBV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAHSDEB, J. H. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer program to calculate three-dimensional boundary layer flows over wings with wall mass
PERKIES, S. C., JE. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIESKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPEE 79-GT-119] PIERCE, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] N79-23122	PUZYREV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAMSDEM, J. M. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer program to calculate three-dimensional
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPEE 79-GT-119] A79-32389 PIERBON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] PILIUGIB, H. W. Effect of friction on motion of a piston driven by	PUZYREV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZYNSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAHSDEN, J. M. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer 'program to calculate three-dimensional houndary layer flows over wings-with wall mass transfer [NASA-CR-3123] RANDLE, N. C.
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPEE 79-GT-119] A79-32389 PIEREON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] PILIUGIN, B. N. Effect of friction on motion of a piston driven by combustion products	PUZITEV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft A79-33636 RAHSDEN, J. H. Aircraft glassmaker RAHDALL, J. L. Computer program to calculate three-dimensional houndary layer flows over wings with wall mass transfer [NASA-CR-3123] RANDLE, B. C. The trajectories of spherical particles in flow
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLINSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPER 79-GT-119] A79-32389 PIERRON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] PILIUGIB, M. M. Effect of friction on motion of a piston driven by combustion products A79-35656	PUZYREV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAMSDEB, J. H. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer program to calculate three-dimensional houndary layer flows over wings with wall mass transfer [NASA-CR-3123] RANDLE, B. C. The trajectories of spherical particles in flow through cascaded turning vanes [BU-220] N79-23096
PERKIBS, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack PERLIBSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPEE 79-GT-119] A79-32389 PIEREON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] PILIUGIN, B. N. Effect of friction on motion of a piston driven by combustion products A79-35656 PISAHO, A. D. Assessment of augmented electronic fuel controls	PUZITEV, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of alumnized and nonalumnized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft A79-33636 RAMSDEM, J. H. Aircraft glassmaker A79-34470 RANDALL, J. L. Computer program to calculate three-dimensional houndary layer flows over wings with wall mass transfer [NASA-CR-3123] RANDLE, M. C. The trajectories of spherical particles in flow through cascaded turning vanes [BU-220] RAO, S. S.
PERKIES, S. C., JR. Prediction of lateral aerodynamic loads on aircraft at high angles of attack N79-22024 PERLINSKI, J. Designing aircraft shock absorbers PERRIER, P. C. Visualisations and calculations of air intakes at high angles of attack and low Reynolds number N79-22030 PHILIPPE, JJ. Experimental studies of unsteady aerodynamics on wind tunnel models of helicopter rotors A79-32295 PIAZZOLI, G. Dynamic identification of light aircraft structures and flutter certification [ONERA, TP NC. 1979-31] A79-32302 PICO, L. RPV electric power system study. Phase 2: Hot bench mockup development [AD-A065008] PIERCE, B. L. Nuclear Bi-Brayton system for aircraft propulsion [ASME PAPER 79-GT-119] A79-32389 PIERRON, G. Modernization of the low speed wind tunnel at Brequet de Velizy: Measuring system modernization [AAAF-NT-78-12] PILIUGIB, M. M. Effect of friction on motion of a piston driven by combustion products A79-35656	PUZYRBY, V. A. Radio-engineering tracking systems A79-35501 Q QUEHARD, C. Implementation of unsteady oscillatory flows in a transonic wind tunnel A79-32290 R RACZINSKI, Z. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A A79-32586 RAJPAUL, V. K. Unique crew escape concepts for ATS mission aircraft - A79-33636 RAMSDEB, J. H. Aircraft glassmaker RANDALL, J. L. Computer 'program to calculate three-dimensional houndary layer flows over wings-with wall mass transfer [NASA-CR-3123] RANDLE, B. C. The trajectories of spherical particles in flow through cascaded turning vanes [BU-220] N79-23096

PERSONAL AUTHOR INDEX SARAVANAHUTTOO, H. I. H.

RAO, V. R. Optimization of wing structures to satisfy	¥	BONABRO, J. Behavior of adhesively bonded joints under	cyclic
strength and frequency requirements	170 26717	loading	#30-330E3
RAVEBBALL, R.	A79-35717	BOTE, S.	N79-23453
Advanced composite engine rotor design [AD-A063843]	N79-22105	Economical processing for the fabrication components	
REBONT, J. Unsteady effects on a stalled wing in puls	end flow	[DGLR PAPEE 79-009] BOUSSEAU, J.	A79-33600
- Comparison with back-and-forth oscilla		Basis for an objective evaluation of the p jumping reliability	aratroop
RECHTER, H.		31y	A79-33619
Design and testing of two supercritical co	_	ROWLAND, G. Conflict alert for the air traffic control	
[ASME PAPER 79-GI-11] REED, F. H.	A79-32330	RUDIS, V. I.	A79-33605
NC equipment spurs blisk manufacture - Ful production slated	ll-scale	Semiautomatic control of aircraft: Systems manual aircraft control	of
	A79-33589		A79-34504
RENAUD, J. Retreating blade and dynamic stall	179-32294	BUETERIK, J. R. Wind-tunnel shock-tube simulation and eval of blast effects on an engine inlet	uation
REYNOLDS, J.	177 32274	[AD-A065388]	N79-23092
FAA proposes that the standard noise model integrated noise model /INB/		RUSSELL, P. L. Lo-frequency augmentor instability investi	gation
RICHARDS, P. H.	A79-34975	computer program user's manual [AD-A065774]	N79-23093
Preliminary studies using photon correlatively velocimetry in turbomachinery and combus		RUSSELL, P. Z. Lo-frequency augmentor instability study	23073
systems	A79-34314	[AD-A065144]	N79-22104
RICHARDSON, D.	873-34314	RZEHER, R. Technical characteristics and cost data for	r the
Weapons for the black-box war	A79-34824	I1-62 and I1-62M aircraft and optimal fl conditions	.1ght
RICKARD, W. W. Active control transport design criteria			A79-35475
[PAPER-6663]	N79-23065	` S	
RIDDER, S. O.			
Wind tunnel test at low speeds of a dorsal intake on a fighter configuration	N79-22029	SIDEH, W. Z. Effects of turbulence on laminar separatio aerodynamic surfaces such as airfoils an	
RIPPEL, B. E.	1177 12027	compressor blading	ıu
Time-variant aerodynamics of oscillating a surfaces in a supersonic flowfield	arfoil	[NAŠA-CR-158488] SAPARIK, P.	N79-22036
	A79-34531	The flow past a supersonic trailing edge i	L n
RIO, R. A. Laser balancing demonstration on a high-sp	need	transonic turbine cascades	A79-32670
flexible rctor		SAINT BILAIRB, A. O.	
	A79-32351	Effect of interblade phase angle and incid	lence
ROBERTS, D. L. Pactors in evaluating the effectiveness of collision avoidance logic	E a.	angle on cascade pitching stability [ASHE PAPER 79-GT-153] SAINTSBURY, J. A.	A79-32418
	A79-33607	A review of small gas turbine combustion s	ystem
ROBERTS, L. A. Thunderstorm turbulence investigations for	-	development [ASME PAPER 79-GT-136]	A79-32405
1973-1974 in support of the National Sev		SAKAI, T.	
Storms Laboratory (NSSL)	*****	Experimental study on diffusers for mixed-	flow
[AD-A065943] ROBERTS, W. B.	N79-23604	machines [ASME PAPER 78-GT-120]	A79-32936
An off-design correlation of part span dam		SAMPATH, P.	
losses through transonic axial fan rotor [ASME PAPER 79-GI-6]	rs A79-32329	A review of small gas turbine combustion s	ystem
Low-turbulence high-speed wind tunnel for		development [ASME PAPER 79-GT-136]	A79-32405
determination of cascade shock losses	**** ******	SAMPATH, S.	
[ASME PAPER 79-GT-129] ROBINS, A. W.	A79-32398	Development of a viscous vortex/wing inter program for thick wings with bounded lea	ding edge
Aerodynamic characteristics at Mach number		[AD-A065181]	N79-23020
1.5, 1.8, and 2.0 of a blended wing-body configuration with and without integral		SAMPSON, R. The flow through low cambered transonic tu	rbine
[NASA-TP-1427]	N79-23013	cascade	
ROBINSON, S. R. Multichannel infrared receiver performance	2	SABBE, M.	N79-22089
	A79-35210	Experimental study on diffusers for mixed-	flow
RODGERS, C. Starting torque characteristics of small a	vereft	machines	A79-32936
gas turbines and APU's	illClait	[ASME PAPER 78-GT-120] SANDELL, N. R., JR.	A79-32930
[ASHE PAPER 79-GT-95]	A79-32371	Investigation of the Multiple Method Adapt	
ROGERS, L. C. Engine evaluation of a vibration damping t	treatment	Control (MNAC) method for flight control [NASA-CR-3089]	. systems N79-23099
for inlet guide vanes		SANDERCOCK, D. H.	/
[ASME PAPER 79-GT-163] ROBLIK, H. E.	A79-32425	An off-design correlation of part span dam losses through transonic axial fan rotor	
Design problems of small turbomachinery		[ASME PAPER 79-GT-6]	A79-32329
DOTOWN & D	N79-22097	Low-turbulence high-speed wind tunnel for	the
ROITHAN, A. B. Damping capacity of paired shrouded turbin	ne blades	determination of cascade shock losses [ASME PAPER 79-GT-129]	A79-32398
in relation to shroud contact conditions	5	SARAVABABUTTOO, H. I. H.	
	A79-32827	A low cost, on-site performance monitoring [ASME PAPER 79-GT-21]	system A79-32334
		[52554

PERSONAL AUTHOR INDEX

	_	SKOW, A. H.	
Ignition of fuel sprays by hot surfaces a stabilization of aircraft fires	nd	Forebody/wing vortex interactions and thei	
[AD-A065153]	N79-23181	influence on departure and spin resistan	N79-2200
SATTER, H. A.		SLOADE, E.	
Response of plate to nonstationary random		Inflatable survival systems for helicopter	
CCORTCUI I	179-34604	CIABLERY 1 3	A79-33624
SCHRICHL, L. Preventing fires in airport fuel systems		SLOVISKY, J. A. Low-turbulence high-speed wind tunnel for	t he
income and an arrest rate by second	A79-34923	determination of cascade shock losses	CHC
SCHIMNING, P.		[ASME PAPER 79-GT-129]	A79-32398
Design and testing of two supercritical c	ompressor	SMALLEY, A. J.	_
cascades	170 22220	Elastomer mounted rotors - An alternative	for
[ASME PAPER 79-GT-11] SCHLIBKELMANN, R. J.	A79-32330	smoother running turbomachinery [ASME PAPER 79-GT-149]	A79-32410
Operational experience with adhesive bond	ed	SEILEY, R. P.	A/J 32414
structures		Wind-tunnel shock-tube simulation and eval	uation
	N79-23450	of blast effects on an engine inlet	
SCHHITT, V.		[AD-A065388]	N79-23092
Vortex pattern developing on the upper su a swept wing at high angle of attack	riace or	SHITH, A. B. Omega possibilities: Limitations, options	and
a swept wing at nigh angle of attack	N79-22007	opportunities	, and
SCHNEIDER, C. P.		[AD-A065027]	N79-23063
Normal force and pitching moment of wing-		SHITH, C. W.	
combinations in the nonlinear angle-of-	attack	Design guidelines for the application of f	
range at subsonic speeds	N70 22022	and nose strakes to a fighter aircraft b	ased on
SCHWEIDER, R.	N79-22022	F-16 wind tunnel testing experiment	N79-22000
Economical processing of fiber-reinforced		SMITH, G. D.	1175 22000
components with thermal expansion mold:		Preliminary studies using photon correlati	on
[DGLR PAPER 79-011]	A79-32307	velocimetry in turbomachinery and combus	tion
SCHROEDER, K. P.	- -	systems	170 20240
Parametric analysis of stereometric track use in tactical aircraft	er ior	SHITH, J. H. B.	A79-34314
[AD-A064688]	N79-22086	Strake-induced separation from the leading	edges
SCHUELER, C. J.		_of wings of moderate speep	•
Experimental studies in a Ludwieg tube tr	ansonic		N79-22002
tunnel	N79-23111	SHITH, J. H.	
SCHWARZ, G.	M/9-23111	Performance of a vortex-controlled diffuse annular swirl-can combustor at inlet Mac	
An exploratory investigation of quasi-free	e flying	numbers up to 0.53	-
models in a supersonic short-duration w		[NASA-TP-1452]	N79-22099
	A79-35925	SMITH, M. S.	
SCOTT, D. W. Thermodynamics of organic compounds		Experimental analysis of V.H.F. antennas f helicopter homing systems using scale-mo	
[AD-A065664]	N79-23232	techniques	dei
SCOTT, H. A., JR.			A79-34392
F-100 turbine engine afterburner emission		SMITH, N. K.	
[AD-A063789]	N79-22109	Thermodynamics of organic compounds	770 2222
SEGER, J. L. Advanced technology fuel mass flowmeter		[AD-A065664] SNOW, D. W.	N79-23232
[AD-A063963]	N79-22108	Study of blade aspect ratio on a compresso	r front
SEID, R. C.		stage aerodynamic and mechanical design	
Influence of gridboard line width and spa	cing on	[NASA-CR-159555]	N79-23085
windscreen distortion measurements		SOPUR, Y.	
	#70_22070	Ori cancers fall demons for reducing make	
[AD-A065821]	N79-23070	011 squeeze film dampers for reducing wibr	ation of
		aircraft gas turbine engines	ation of A79-32402
[AD-A065821] SELF, H. C. Influence of gridboard line width and spa- windscreen distortion measurements	cing on	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBERSEN, P.	A79-32402
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821]		aircraft gas turbine engines [ASBE PAPER 79-GT-133] SOBEBSEN, P. Test plan for a one-half scale laboratory	A79-32402
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIRD, P. H.	cing on N79-23070	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBENSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system	A79-32402 model of
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIED, P. H. Global services systems - Space communica	cing on N79-23070 tion	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOREWSRW, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171]	A79-32402
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIRD, P. H.	cing on N79-23070	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBENSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system	A79-32402 model of N79-23115
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [AIAA 79-0946] SHEOUT, B. L. Surface pressure data for a supersonic-cr	cing on N79-23070 tion N79-34761	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBUSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H.	A79-32402 model of N79-23115 ape
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [AIAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Each numbers	cing on N79-23070 tion N79-34761	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOREWSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system	A79-32402 model of N79-23115
[AD-A065821] SELF, H. C. Influence of gridboard line width and space windscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica (AIAA 79-0946) SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2.96, 3.30)	cing on N79-23070 tion A79-34761 uise of 2.30,	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBEBSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. F.	A79-32402 model of N79-23115 ape A79-33635
[AD-A065821] SBLF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica [ATAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-cr airplane configuration at Mach numbers of 2.96, 3.30 [NASA-TH-80061]	cing on N79-23070 tion N79-34761	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBHSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission	A79-32402 model of N79-23115 ape A79-33635 tests
[AD-A065821] SELF, H. C. Influence of gridboard line width and space windscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica (AIAA 79-0946) SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2.96, 3.30)	cing on N79-23070 tion A79-34761 uise of 2.30,	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBEBSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. F.	A79-32402 model of N79-23115 ape A79-33635
[AD-A065821] SBLF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-cr airplane configuration at Mach numbers of 2.96, 3.30 [NASA-TH-80061] SIBLEY, W. J. A study of the Sheriff's wing [BU-215]	cing on N79-23070 tion A79-34761 uise of 2.30,	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SOEGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPARGIER, S. B. Prediction of lateral aerodynamic loads on	A79-32402 model of N79-23115 ape A79-33635 tests
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica [AIAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-criairplane configuration at Mach numbers (2.96, 3.30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C.	cing on N79-23070 tion A79-34761 uise of 2.30, N79-22051	aircraft gas turbine engines [ASME PAPER 79-GT-133] SOBEBSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPABGLER, S. B.	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIND, F. H. Global services systems - Space communica [AIAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers 2.96, 3.30 [NASA-TM-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIBG, C. The confluence of two supersonic jets at the confluence of t	cing on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072	aircraft gas turbine engines [ASHE PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. F-100 turbine engine afterburner emission [AD-A063789] SPABGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack	A79-32402 model of N79-23115 ape A79-33635 tests
[AD-A065821] SELF, H. C. Influence of gridboard line width and spawindscreen distortion measurements [AD-A065821] SHEPPHIRD, F. H. Global services systems - Space communica [AIAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-criairplane configuration at Mach numbers (2.96, 3.30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C.	mise of 2.30, m79-22051 m79-23072	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPARGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST-BILAIRE, A. O.	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIND, F. H. Global services systems - Space communica [AIAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2.96, 3.30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine blades	ming on ming-23070 tion ming-34761 use of 2.30, ming-22051 ming-23072 the es ming-23426	aircraft gas turbine engines [ASHE PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. F-100 turbine engine afterburner emission [AD-A063789] SPABGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2,96, 3,30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIEG, C. The confluence of two supersonic jets at trailing edge of transonic turbine blades. SIEVERDIEG, C. H. The flow through low cambered transonic t	ming on ming-23070 tion ming-34761 use of 2.30, ming-22051 ming-23072 the es ming-23426	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBHSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1:
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIND, F. H. Global services systems - Space communica [AIAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2.96, 3.30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine blades	cing on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBHSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. M. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.BILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092]	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIND, F. H. Global services systems - Space communica [AIAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers 2.96, 3.30 [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIEG, C. The confluence of two supersonic jets at trailing edge of transonic turbine bladd. SIEVERDIEG, C. H. The flow through low cambered transonic t cascade	ming on ming-23070 tion ming-34761 use of 2.30, ming-22051 ming-23072 the es ming-23426	aircraft gas turbine engines [ABME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. F. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W.	A79-32402 model of N79-23115 ape A79-33635 tests N79-22105 N79-22024 loading lume 1:
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2,96, 3,30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIEG, C. The confluence of two supersonic jets at trailing edge of transonic turbine blades. SIEVERDIEG, C. H. The flow through low cambered transonic t	mise of 2.30, m79-22051 m79-23072 the es m79-23426 urbine m79-22089	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPARGIER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1:
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers of 2.96, 3.30 [NASA-TM-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIEG, C. The confluence of two supersonic jets at trailing edge of transonic turbine blad. SIEVERDIEG, C. H. The flow through low cambered transonic t cascade SILVERHAD, B.	cing on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine N79-22089 Hethods	aircraft gas turbine engines [ABME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. F. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1:
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2,96, 3,30) [NASA-TH-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDIEG, C. The confluence of two supersonic jets at trailing edge of transonic turbine blade. SIEVERDIEG, C. H. The flow through low cambered transonic t cascade SILVERBAD, B. Study of BADC newport antenna test range: of reflection reductions and increased coverage	mathemathemathemathemathemathemathemathe	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SOEGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPABGIER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1: N79-22052 bonding
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHEOUT, B. L. Surface pressure data for a supersonic-cr airplane configuration at Mach numbers of 2.96, 3.30 [NASA-TH-80061] SIBLEY, W. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine bladd. SIEVERDING, C. H. The flow through low cambered transonic t cascade SILVERHAN, B. Study of BADC newport antenna test range: of reflection reductions and increased coverage [AD-A065151]	cing on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine N79-22089 Hethods	aircraft gas turbine engines [ABME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. F. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1: N79-22052 bonding N79-23251
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIND, F. H. Global services systems - Space communica [AIAA 79-0946] SHBOUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers 2.96, 3.30 [NASA-TM-80061] SIBLEY, B. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine bladd. SIEVERDING, C. H. The flow through low cambered transonic t cascade SILVERHAM, B. Study of RADC newport antenna test range: of reflection reductions and increased coverage [AD-A065151] SKIFSTD, J. G.	ting on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine N79-22089 Methods frequency N79-23331	altcraft gas turbine engines [ASME PAPER 79-GT-133] SOREBSEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SORGES, D. M. Development and testing of a dual mode esc propulsion system SOUSA, A. F. P-100 turbine engine afterburner emission [AD-A063789] SPANGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components STAHL, W. H. Aerodynamics of low aspect ratio wings	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1: N79-22052 bonding
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHEOUT, B. L. Surface pressure data for a supersonic-cr airplane configuration at Mach numbers of 2.96, 3.30 [NASA-TH-80061] SIBLEY, W. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine bladd. SIEVERDING, C. H. The flow through low cambered transonic t cascade SILVERHAN, B. Study of BADC newport antenna test range: of reflection reductions and increased coverage [AD-A065151]	ting on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine N79-22089 Methods frequency N79-23331	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SOEGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPABGIER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components	A79-32402 model of N79-23115 ape A79-33635 tests N79-22105 N79-22024 loading lume 1: N79-22052 bonding N79-23053
[AD-A065821] SELF, H. C. Influence of gridboard line width and spanwindscreen distortion measurements [AD-A065821] SHEPPHIED, F. H. Global services systems - Space communica [ATAA 79-0946] SHROUT, B. L. Surface pressure data for a supersonic-crairplane configuration at Mach numbers (2,96, 3,30) [NASA-TM-80061] SIBLEY, H. J. A study of the Sheriff's wing [BU-215] SIEVERDING, C. The confluence of two supersonic jets at trailing edge of transonic turbine blade. SIEVERDING, C. H. The flow through low cambered transonic t cascade SILVERNAM, B. Study of RADC newport antenna test range: of reflection reductions and increased coverage [AD-A065151] SKIFSTD, J. G. Ignition of fuel sprays by hot surfaces at	ting on N79-23070 tion A79-34761 uise of 2.30, N79-22051 N79-23072 the es N79-23426 urbine N79-22089 Methods frequency N79-23331	aircraft gas turbine engines [ASME PAPER 79-GT-133] SORBESEN, P. Test plan for a one-half scale laboratory a rigid skirt hold-down system [AD-A065171] SOEGES, D. H. Development and testing of a dual mode esc propulsion system SOUSA, A. P. P-100 turbine engine afterburner emission [AD-A063789] SPABGLER, S. B. Prediction of lateral aerodynamic loads on aircraft at high angles of attack ST.HILAIRE, A. O. The influence of sweep on the aerodynamic of an oscillating NACA 0012 airfoil. Vo Technical report [NASA-CR-3092] STACHER, G. W. Concurrent superplastic forming/diffusion of B-1 components STALLEY, W. H. Aerodynamics of low aspect ratio wings	A79-32402 model of N79-23115 ape A79-33635 tests N79-22109 N79-22024 loading lume 1: N79-22052 bonding N79-23251

PERSONAL AUTHOR INDEX TITIRIGA, A., JR.

ressor	SWANSON, D. E. Unique crew escape concepts for ATS mission	alrcraft A79-33636
79-32330	SWARSON, E. E. Factors affecting omega accuracy	
•	[BDBE-71]	N79-22069
79-22003		and
	[AD-A065027]	N79-23063
	Definition of requirements for a performance	
79-32394		
		N79-22119
79-33611	Study of compressor aeroelastic instability	es in a
nce	[ONERA, TP NO. 1979-6]	A79-3229
79-22067		
	aluminized and nonaluminized jet-engine t	urbine
		A79-32586
/9-23/54	-	
79-22637		vet one
ation	terrain flight	
79-22039		N79-23098
., 2203)		to the
nning	design of a low-aspect-ratio turbine	170 222#6
79-23084		A79-32348
	Airline productivity redefined - An analysi	.s of
	U.S. and European carriers	A79-35100
79-33590		
-ad		N79-22065
,eu	TABBA, B. K.	M/J 2200
79-22077		
ınd		:
	[AD-A064685]	N79-22854
79-23125		straint
ırbine	system mock-up study	
70-72075	[AD-A064207]	N79-22081
79-32933		nced
10 22405	attack helicopter	
		N79-22077
10n	Predesign of the second generation comprehe	nsıve
ice		N79-22084
79-23087		M/
19-22522		rbine
-	[ASME PAPER 79-GT-99]	A79-32375
ing		or
79-33614	smoother running turbomachinery	
	[ASME PAPER 79-GT-149]	A79-32414
	supersonic jet noise. Volume 2, appendix	
79-22105		N79-22854
	TERALL, R. W., JR.	2203
tors	Parlures in adhesively bonded structures	N70_2286
	THEARE, B. V.	N79-23454
	Factors affecting omega accuracy	
		N79-22069
79-22107		ept
	wings with leading edge vortices	270_22A24
9-23252		N79-22021
	Porebody/wing wortex interactions and their	
ıd,		e N79-22001
9-22063		22001
	79-33590 ced 79-22077 wind 79-23125 arbine 79-32935 79-22105 clon ace 79-23087 79-22522 ing 79-33614 79-33615 79-22105 lan stors 79-32457	SWABSOM, R. B. 79-32330 SWABSOM, R. B. Pactors affecting omega accuracy [BDE7-71] Omega possibilities: Limitations, options, opportunities games

TOKAR, I. G. Damping capacity of paired shrouded turbing in relation to shroud contact conditions		VARGANOV, I. S. Characteristics of Laval mozzles with gasdynamic regulation A79-34	650
TOLBERT, R. H.	E/J J202/	VAUGHAB, J. C., III	050
Comparison of store trajectory and aerodyn loads, and model flow-field characterist obtained in the AEDC FWT/4T and VFK/A witunnels at Mach number 1.63	ıcs	Concept for a large multi-mission amphibian aircr: [AIAA 79-0849] A79-339 VAVRA, B. Axial flow turbines	
[AD-A065137]	N79-23017	N79-22	092
TORISAKI, T. Oil squeeze film dampers for reducing vibra	ation of	WAYSSAIRE, J. C. Wall interference effects	
aircraft gas turbine engines		N79-23	113
[ASME PAPER 79-GT-133] TRAYHOR, W. L.	A79-32402	VEDERHIKOV, IU. A. Optimization of hypersonic three-dimensional shape	es
Death by misadventure	A79-33640	VELOPILLAI, D.	584
TREMBACK, J. W.	R73 33040	Britain's better airbus wing	
Effect of number of probes and their orien on the calculation of several compressor		VERBRUGGE, R. A.	823
distortion descriptors [NASA-TH-72859]	N79-23087	Aircraft response to lateral gusts- Exploratory study	
TRIBBSTRIN, H.		A79-322	278
Unsteady pressure measurements on rotor blue with incidence	ade tips	VERGARA, R. D. Extended analytical study of the	
TRUBY, T. J.	A79-34534	free-wing/free-trimmer concept [NASA-CR-3135] N79-22	0110
Off-airport land use compatibility - The M	aryland	VERHAAGRE, E. G.	U 4 U
approach and experience	A79-34974	An experimental investigation of the entrainment of a leading-edge vortex	
TSOUBANOS, C. N.		N79-220	033
Stabilized Terrain Optical Position Sensor flight test report	(STOPS)	The flow past a supersonic trailing edge in	
[AD-A065018]	N79-23100	transonic turbine cascades	
TUPPLEY, P. B. An investigation into the transient aerody	namics	A79-320 Some experimental results connected with the	670
associated with a spoiler emerging into a uniform airstream		transonic instabilities on an airfoil	671
[80-219]	N79-23046	WOLLMBR, R. G. Ultrasonic bonding arrives - 75% cost savings see	
TUMANOVSKII, A. G. Formation of sooty particles in combustion		A79-33!	
chambers with series injection of air in combustion zone	to the	VOROZHTSOV, B. V. On some methods for the numerical simulation of	
Compustion 20ne	A79-34550	flows with complex structure	
TURNAGE, G. Advanced Simulator for Pilot Training (ASP)	T):	<u>1</u> 379−340	691
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-engin	eering	a79-34(69 1
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-engin [AD-A063283]		- a79−340	691
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZIOK, W Calculation and design of closed cycle help	eering N79-22118	WALDON, C. A. Evaluation of an energy distribution system for	691
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZIOK, W.	eering N79-22118 lum	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing	
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliturbines for high temperature reactors TYBURSKI, J. J.	eering N79-22118 1UM N79-22098	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H.	
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliturbines for high temperature reactors	eering N79-22118 1UM N79-22098	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298]	
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZION, W. Calculation and design of closed cycle heliturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance in the second secon	eering N79-22118 1UM N79-22098	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts	069
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZION, W. Calculation and design of closed cycle heliturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance in the second secon	eering N79-22118 1um N79-22098 rmance	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22	069
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliturbines for high temperature reactors TYBURSKI, J. An overview of the U.S. Navy Maximum Performance of the U.S.	eering N79-22118 1um N79-22098 rmance	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-23 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKLEY, K. B. Aerodynamic design and analysis of the AST-200	069
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Perfore Ejection System U UBBLING, D. B.	eering N79-22118 1um N79-22098 rmance	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] WALKLEY, K. B.	069 102
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliculations for high temperature reactors TYBURSKI, J. An overview of the U.S. Navy Maximum Perform Ejection System URHLING, D. E. Regression simulation of turbine engine performance/aircraft regression model	eering N79-22118 lum N79-22098 rmance A79-33613	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-23 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22	069 102 046
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle heliculations for high temperature reactors TYBURSKI, J. An overview of the U.S. Navy Maximum Performance of the Design of turbine engine performance aircraft regression model [AD-A063975]	eering N79-22118 1um N79-22098 rmance	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. B. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] WALKO, L. C. Lightning transient research on an F-111F aircraff [AD-A063765] N79-220	069 102 046
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliculations for high temperature reactors TYBURSKI, J. An overview of the U.S. Navy Maximum Perform Ejection System URHLING, D. E. Regression simulation of turbine engine performance/aircraft regression model	eering N79-22118 lum N79-22098 rmance A79-33613	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKERY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKEL, C. Lightning transient research on an F-111F aircraft [AD-A063765] N79-220 WALLER, F. T.	069 102 046
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle heliculation and design of closed cycle heliculation. TYBURSKI, J. An overview of the U.S. Navy Maximum Performance	eering N79-22118 1um N79-22098 rmance A79-33613	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] WALKO, L. C. Lightning transient research on an F-111E aircraft [AD-A063765] WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid	069 102 046
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle helicitus for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Perform Ejection System U UBBLING, D. E. Regression simulation of turbine engine performance/aircraft regression model [AD-A063975]	eering N79-22118 1um N79-22098 rmance A79-33613	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKO, L. C. Lightning transient research on an F-111F aircraf [AD-A063765] N79-220 WALLER, P. T. Analysis of the mechanical properties of rigid	069 102 046 t 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle heliciturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the District of th	eering N79-22118 1um N79-22098 rmance A79-33613	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064997] WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] WALKO, L. C. Lightning transient research on an F-111F aircraft [AD-A063765] WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] WAHBILL, R. J. B.	069 102 046 t 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle helicaturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of Tystem UBHLING, D. B. Regression simulation of turbine engine performance of aircraft regression model [AD-A063975] V VACHENAUER, E. The measurement of RF-pulse phase and ampli-	eering N79-22118 1um N79-22098 rmance A79-33613 N79-22106 1tude in A79-34608	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKER, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKO, L. C. Lightning transient research on an F-111E aircraf [AD-A063765] N79-22 WALLER, P. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229]	069 102 046 t 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle helicitum to the properties of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of the U.S. Regression simulation of turbine engine performance of aircraft regression model [AD-A063975] VACHENAUER, E. The measurement of RF-pulse phase and amplitude of the landing system DLS VAN HEUSDEE, S. Measurement of ozone in an aircraft	eering N79-22118 1um N79-22098 rmance A79-33613 N79-22106 1tude in A79-34608 A79-34925	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-220 WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-220 WALKO, L. C. Lightning transient research on an F-111F aircraf [AD-A063765] N79-220 WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BD-229] N79-230 WAHHILL, R. J. H. Gust spectrum fatigue crack propagation in candidate skin materials	069 102 046 t 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle helicaturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the District of turbine engine performance aircraft regression model [AD-A063975] V VACHENAUER, E. The measurement of RP-pulse phase and amplitude landing system DIS VAN BEUSDEE, S.	eering N79-22118 1um N79-22098 rmance A79-33613 N79-22106 1tude in A79-34608	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] WALKELY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] WALKEY, K. C. Lightning transient research on an F-111E aircraf [AD-A063765] WALLER, P. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] WANHILL, R. J. B. Gust spectrum fatigue crack propagation in candidate skin materials	069 102 046 t 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging [AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliciturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the District of th	eering N79-22118 1um N79-22098 rmance A79-33613 N79-22106 1tude in A79-34608 A79-34925	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-220 WALKLEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-220 WALKO, L. C. Lightning transient research on an F-111F aircraf [AD-A063765] N79-220 WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-230 WAHHILL, R. J. H. Gust spectrum fatigue crack propagation in candidate skin materials WASHAM, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor	069 102 046 दे 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle helicitude to the properties of the U.S. Navy Maximum Performance of Type of the Maximum Performance of Type of the U.S. Navy Maximum Performance of Type of	eering N79-22118 lum N79-22098 rmance A79-33613 N79-22106 ltude in A79-34608 A79-34925 N79-22078	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKEY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKEY, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-23 WALLER, P. T. Gust spectrum fatigue crack propagation in candidate skin materials WASHAM, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASME PAPER 79-GT-194] A79-32 WASKO, L.	069 102 046 दे 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliculation and design of closed cycle heliculations. TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of Ejection System UBHLING, D. B. Regression simulation of turbine engine performance of aircraft regression model [AD-A063975] VACHENAUER, E. The measurement of RF-pulse phase and amplitude landing system DLS VAN HEUSDEE, S. Heasurement of ozone in an aircraft VANBLARICUM, P. Dynamic behavior of aircraft materials [AD-A064592] VANDERFERKE, C. Effect of the model vertical position in a wall wind tunnel [AAAF-NT-78-05]	eering N79-22118 lum N79-22098 rmance A79-33613 N79-22106 ltude in A79-34608 A79-34925 N79-22078	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATCRIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKERY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKEY, K. C. Lightning transient research on an F-111F aircrafi [AD-A063765] N79-22 WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-23 WAHBILL, B. J. H. Gust spectrum fatigue crack propagation in candidate skin materials WASHAH, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASRE PAPER 79-GT-194] A79-32 WASKO, L. Research on the creep-rupture strength of alumnized and nonaluminized jet-engine turbine	069 102 046 दे 066
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle heliciturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of Regression simulation of turbine engine performance of aircraft regression model [AD-A063975] WACHENAUER, E. The measurement of RP-pulse phase and amplitude landing system DLS WAN HEUSDER, S. Heasurement of ozone in an aircraft WANBLARICUM, P. Dynamic behavior of aircraft materials [AD-A064592] WANDEKREKE, C. Effect of the model vertical position in a wall wind tunnel [AAAP-NT-78-05] VANDERSENDEK, L.	eering N79-22118 lum N79-22098 rmance A79-33613 N79-22106 ltude in A79-34608 A79-34925 N79-22078 slotted N79-23119	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [An-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKER, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKO, L. C. Lightning transient research on an F-111F aircraf [AD-A063765] N79-22 WALLER, P. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-23 WALLER, B. J. B. Gust spectrum fatigue crack propagation in candidate skin materials WASHAM, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASME PAPER 79-GT-194] A79-32 WASKO, L. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A	069 102 046 t 066 227 201
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliculation and design of closed cycle heliculations. TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of Ejection System UBHLING, D. B. Regression simulation of turbine engine performance of aircraft regression model [AD-A063975] VACHENAUER, E. The measurement of RF-pulse phase and amplitude landing system DLS VAN HEUSDEE, S. Heasurement of ozone in an aircraft VANBLARICUM, P. Dynamic behavior of aircraft materials [AD-A064592] VANDERFERKE, C. Effect of the model vertical position in a wall wind tunnel [AAAF-NT-78-05]	eering N79-22118 1um N79-22098 rmance A79-33613 N79-22106 1tude in A79-34608 A79-34925 N79-22078 slotted N79-23119 inment	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATCRIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKERY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKEY, K. C. Lightning transient research on an F-111F aircrafi [AD-A063765] N79-22 WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-23 WAHBILL, B. J. H. Gust spectrum fatigue crack propagation in candidate skin materials WASHAH, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASRE PAPER 79-GT-194] A79-32 WASKO, L. Research on the creep-rupture strength of alumnized and nonaluminized jet-engine turbine	069 102 046 t 066 227 201
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283] TWARDZIOK, W. Calculation and design of closed cycle heliciturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the U.S. Navy Maximum Performance of Ejection System UNION OF THE NAVIEW OF THE PROPERTY OF THE P	eering N79-22118 lum N79-22098 rmance A79-33613 N79-22106 ltude in A79-34608 A79-34925 N79-22078 slotted N79-23119	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [An-A065298] N79-230 WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] N79-22 WALKER, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] N79-22 WALKE, E. C. Lightning transient research on an F-111F aircraf [AD-A063765] N79-22 WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] N79-23 WALLER, B. J. B. Gust spectrum fatigue crack propagation in candidate skin materials WASHAM, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASME PAPER 79-GT-194] A79-32 WASKO, L. Research on the creep-rupture strength of aluminized and nonaluminized jet-engine turbine blades prepared from Nimonic 80A WATERS, K. T. Identification of high payoff research for more	069 102 046 t 066 227 201
Advanced Simulator for Pilot Training (ASP Aerial refueling visual simulation-enging (AD-A063283) TWARDZIOK, W. Calculation and design of closed cycle heliciturbines for high temperature reactors TYBURSKI, J. J. An overview of the U.S. Navy Maximum Performance of the District of the Maximum Performance of the District of the District of the Maximum Performance of the District of the Distr	eering N79-22118 lum N79-22098 rmance A79-33613 N79-22106 ltude in A79-34608 A79-34925 N79-22078 slotted N79-23119 lnment N79-22033	WALDON, C. A. Evaluation of an energy distribution system for helicopter landing gears during hard landing [AD-A065298] WALKER, B. H. Design, fabrication, and evaluation of GATORIZED (trade name) ceramic-wrought alloy attachment concepts [AD-A064597] WALKERY, K. B. Aerodynamic design and analysis of the AST-200 supersonic transport configuration concept [NASA-CR-159051] WALKEY, K. C. Lightning transient research on an F-111F aircrafi [AD-A063765] WALLER, F. T. Analysis of the mechanical properties of rigid foams with particular consideration of a rigid polyether structural foam [BU-229] WAHHILL, B. J. H. Gust spectrum fatigue crack propagation in candidate skin materials WASHAM, R. B. Characteristic time correlations of pollutant emissions from an annular gas turbine combustor [ASRE PAPER 79-GT-194] WASKO, L. Research on the creep-rupture strength of alumnized and nonaluminized jet-engine turbine blades prepared from Nimonic 80 A WATERS, K. T.	069 102 046 t 066 227 201 452

PERSONAL AUTHOR INDEX ZACHARAKIS, J. E.

	-6
Definition of requirements for a performand measurement system for C-5 aircrew member	
[AD-A063282]	N79-22119
WEBB, D. B.	, 22113
Development and initial test results of par	rachutes
with Automatic Inflation Modulation /A.I.	. H. /
sith automatic filliation doddiction / site	A79-33618
WEISERT, E. D.	2.7 330.0
Concurrent superplastic forming/diffusion	honding
of B-1 components	Jonarna
or b , components	N79-23251
WERLE, B.	117 23231
Vortex pattern developing on the upper sur	face of
a swept wing at high angle of attack	
	N79-22007
WESTHORELAND, J. S.	
Variable cycle engine technology program pl	lannıng
and definition study	,
[NASA-CR-159539]	N79-23084
WETHORE, W. C.	
P101 engine derivative work advances	
	A79-34600
WHITE, R. P., JR.	
Prediction and measurement of the aerodynam	nic .
forces and pressure distributions of wing	-tail
configurations at very high angles of at	ack
ourraderions at tory may any or at	N79-22025
WHITEHRAD, A. H., JR.	
Demand for large freighter aircraft as proj	nected
by the NASA cargo/logistics airlift syste	20S
studies	
[AIAA 79-0842]	A79-33829
Demand for large freighter aircraft as proj	
by the NASA cargo/logistics airlift syste	
[NASA-TH-80074]	N79-22061
WILLSKY, A. S.	N73 22001
Investigation of the Multiple Method Adapt:	1 70
Control (MMAC) method for flight control	cvctome
[NASA-CR-3089]	N79-23099
WITTHAN, R. B.	177-23093
Aerospace Transparent Materials and Enclose	TAG
(12th)	ites
[AD-A065049]	N79-23066
	N/9-23000
WOELE, G. U. The anti-upper of the blading surface rough	
The influence of the blading surface rough	ness on
The influence of the blading surface rough the aerodynamic behavior and characterist	ness on
The influence of the blading surface rough the aerodynamic behavior and characterist an axial compressor	tic of
The influence of the blading surface rough the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102]	ness on tic of 179-32378
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLDERS, H. L.	A79-32378
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communication	10 of 179-32378
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 7.9-0946]	A79-32378
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communication [AIAA 79-0946] WOLPE, R. A.	A79-32378 LOD A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and	A79-32378 LOD A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communication [AIAA 79-0946] WOLPE, R. A.	21c of A79-32378 Lon A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures	A79-32378 LOD A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 7.9-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E.	21c of A79-32378 Lon A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLDERS, H. L. Global services systems - Space communicat: [AIAA 7,9-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E. Electromechanical actuation development	21c of A79-32378 LOD A79-34761 A79-23075
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734]	21c of A79-32378 Lon A79-34761
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 7.9-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R.	21c of A79-32378 Lon A79-34761 3 N79-23075 N79-23101
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 7.9-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R.	21c of A79-32378 Lon A79-34761 3 N79-23075 N79-23101
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359]	A79-32378 A79-34761 A79-23075 N79-23101 Anced N79-22077
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, H. B. Blectromechanical actuation development [AD-A065734] WORATSCHEK, R. Bugineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlle	A79-32378 A79-34761 A79-23075 N79-23101 Anced N79-22077
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Plight evaluation NK 2 integrated controlle installed in an GR-58A helicopter	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072]	A79-32378 A79-34761 A79-23075 N79-23101 Anced N79-22077
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation MK 2 integrated controlled installed in an CE-581 helicopter [AD-A065072] WRIGHT, D. G.	A79-23075 A79-23075 A79-23075 A79-23101 Anced A79-22077 EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 7,9-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation MK 2 integrated controlled installed in an GE-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlated	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 er N79-23103
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlle installed in an OB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combuse	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 er N79-23103
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 7,9-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation MK 2 integrated controlled installed in an GE-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlated	A79-23075 N79-23075 N79-23101 Anced N79-22077 ETT N79-23103
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlle installed in an OB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combuse	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 er N79-23103
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlle installed in an OB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combuse	A79-23075 N79-23075 N79-23101 Anced N79-22077 ETT N79-23103 On tion
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, adva attack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlle installed in an OB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combuse	A79-23075 N79-23075 N79-23101 Anced N79-22077 ETT N79-23103 On tion
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicat: [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation NK 2 integrated controlled installed in an CB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems	A79-23075 N79-23075 N79-23101 Anced N79-22077 ETT N79-23103 On tion
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 ET N79-23103 On Lon A79-34314
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CH-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 ET N79-23103 On Lon A79-34314
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 Pr N79-23103 Dn A79-34314
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 PT N79-23103 Dn Lon A79-34314 Lse as a A79-34537
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A06359] Flight evaluation MK 2 integrated controlled installed in an CH-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet non function of Reynolds number Asymmetry of a circular jet observed in near	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 PT N79-23103 Dn Lon A79-34314 Lse as a A79-34537
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 Pr N79-23103 Dn A79-34314 Lse as a A79-34537 Ar and
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlled installed in an CB-583 helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number Asymmetry of a circular jet observed in neafar fields	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 PT N79-23103 Dn Lon A79-34314 Lse as a A79-34537
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicating [AIAA 79-0946] WOLFE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. E. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation MK 2 integrated controlled installed in an CH-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet non function of Reynolds number Asymmetry of a circular jet observed in neafar fields YOCUB, A. H., II	A79-34314 A79-34539 A79-34539
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation NK 2 integrated controlled in an CH-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number Asymmetry of a circular jet observed in neaf fields YOCUB, A. H., II The effects of design and operating variable	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 Pr N79-23103 Dn Lon A79-34314 Ase as a A79-34537 Ir and A79-34539 Les on
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Flight evaluation NK 2 integrated controlled installed in an OB-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number Asymmetry of a circular jet observed in neafar fields YOCUB, A. H., II The effects of design and operating variable the response of an axial flow fan to independent in the subspace of the proposed in a processor of the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of an axial flow fan to independent in the response of the processor in the processor in the response of the processor in the processor in the response of the processor in the pro	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 Pr N79-23103 Dn Lon A79-34314 Ase as a A79-34537 Ir and A79-34539 Les on
The influence of the blading surface rought the aerodynamic behavior and characterist an axial compressor [ASME PAPER 79-GT-102] WOLBERS, H. L. Global services systems - Space communicate [AIAA 79-0946] WOLPE, R. A. US Army helicopter fatigue requirements and substantiation procedures WOOD, B. B. Electromechanical actuation development [AD-A065734] WORATSCHEK, R. Engineer design test 1, Hughes YAH-64, advantack helicopter [AD-A064359] Plight evaluation NK 2 integrated controlled in an CH-58A helicopter [AD-A065072] WRIGHT, D. G. Preliminary studies using photon correlation velocimetry in turbomachinery and combust systems Y YAHAHOTO, K. Peak Strouhal frequency of subsonic jet not function of Reynolds number Asymmetry of a circular jet observed in neaf fields YOCUB, A. H., II The effects of design and operating variable	A79-32378 Lon A79-34761 N79-23075 N79-23101 Anced N79-22077 Pr N79-23103 Dn Lon A79-34314 Ase as a A79-34537 Ir and A79-34539 Les on

The effects of design and operating variables on the response of an axial flow fan to inlet flow distortions
[AD-A058959] N79-23094

YOSHIHARA, B.
Subcritical drag minimization for highly swept wings with leading edge vortices

N79-22021

Ζ

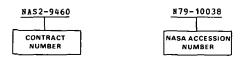
ZACHABARIS, J. R.
An investigation into the pressure distributions over a wing and store combination at low speeds [BU-226] N79-23047

CONTRACT NUMBER INDEX

AERONAUTICAL ENGINEERING / A Continuing Bibliography (Suppl 112)

AŬGUȘT 1979

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the IAA accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the IAA or STAR section.

AP PROJ. 4860	DAAJ02-77-C-0065
N79-23454	N79-23091
AP PROJ. 1123	Daajo2-77-c-0074
N79-22118	#79-22085
AP PROJ. 2093	DAAJ02-77-C-0075
N79-23595	N79-22080
AF PROJ. 2103	DAAK70-77-C-0254
N79-22109	N79-22070
AF PROJ. 2307	979-22071
N79-23028	DAAK70-78-C-0001
AP PROJ. 3048	A79-32438
N79-22882	DABC04-75-G-0142
AP PROJ. 3066	979-23071
N79-22106	DNA001-76-C-0107
N79-23090	N79-23092
AF PROJ. 3145	DNA001-77-C-0103
N79-22110	N79-22078
AP PROJ. 7662	DTCA-77/9831300/481/7586
N79-23083	A79-32288
AP-AFOSR-74-2675	FAA PROJ. 071-713-000
A79-32386	N79-22116
A79-32387	F08635-77-C-0216
AP-AFOSR-2802-75	N79-22109
N79-23089	F30602-75-C-0121
AF-AFOSR-3446-77	N79-23331
N79-23181	P33615-c-0020
AFOSR-ISSA-78-0009	A79-33646
N79-23232	P33615-68-C-1227
BNVG-HTU-ZTL-4,05/7	A79-33646
A79-32443	P33615-73-R-3149
BMVG-MTU-ZTL-4,05/8	A79-33646
A79-32443	F33615-75-C-2030
DA PROJ. 1L1-61102-AH-45	N79-22882
N79-22037	P33615-76-c-0056
DA PROJ. 1L2-62209-AH-76	N79-22119
N79-22080	F33615-76-C-1307
N79-22085	N79-23083
N79-23091	r33615-76-c-2021
DA PROJ. 1L2-63211-D-157	n79-22854
N79-22082	F33615-76-C-2024
N79-22083	N79-22104
N79-22084	N79-23093
DA PROJ. 417-63734-DT-08 879-23260	P33615-76-C-2069
DAAD05-74-C-0747	¥79-22110 ¥33615-76-C-2092
N79-22523	A79-32441
DAAG39-77-C-0186	A79-32445
N79-22107	A79-32935
DAAJ02-74-C-0054	F33615-76-C-3043
N79-22522	N79-23101
DAAJ02-74-C-0065	F33615-77-C-0116
N79-23067	A79-32389
N79-23068	P33615-77-C-2108
DAAJ02-76-C-0030	N79-22106
879-22108	P33615-77-C-5171
DAAJ02-76-C-0054	A79-32442
N79-22637	P33615-77-C-5201
DAAJ02-77-C-0019	N79-22105
N79-23069	F33615-78-C-2203
DAAJ02-77-C-0057	N79-23090
N79-22082	P44620-76-C-0055
DAAJ02-77-C-0058	N79-23089
N79-22083	P49620-77-C-0023
DAAJ02-77-C-0059	N79-22964
N79-22084	NASA ORDER L-60036-A
813-22004	NASA ORDER 1-60036-A N79-22041
-	

RASA TASK 28 A79-34761 NASA 36074-13 A79-34521 HASW-2800 A79-35097 HAS1-12346 A79-34761 BAS1-12346 BAS1-14517 BAS1-13500 BAS1-14517 BAS1-14873 BAS9-22000 HAS1-15006 BY9-22000 HAS1-15022 BY9-23016 HAS1-15018 BAS2-7007 BAS2-10040 BAS2-10040 BAS2-10040 BAS3-18520 A79-32351 BAS3-20809 BAS2-9807 BAS			
## A79-34521 ## A79-34521 ## A51-12346 ## A79-34761 ## A51-12346 ## A79-34761 ## A51-13500 ## A79-32016 ## A51-14517 ## A79-22015 ## A51-14507 ## A79-22015 ## A51-15006 ## A79-22010 ## A51-15006 ## A79-22010 ## A51-15002 ## A79-23016 ## A51-15078 ## A79-23016 ## A51-15078 ## A79-22068 ## A79-22068 ## A79-22068 ## A52-7007 ## A79-22039 ## A52-10040 ## A79-22076 ## A53-18520 ## A79-22076 ## A53-20801 ## A79-22076 ## A53-20801 ## A79-23081 ## A79-22080 ## A79-22080 ## A79-22080 ## A79-22060 ## A79-22061 ## A79-22062 ## A79-22062 ## A79-22063 ## A79-22064 ## A79-22065 ## A79-22065 ## A79-22066 ## A79-22061 ## A79-22062 ## A79-22062 ## A79-22062 ## A79-22063 ## A79-22062 ## A79-22063 ## A79	NASA		
RAS1-12346			A79-34521
RAS1-13500 R79-22046 RAS1-14877 R79-23114 RAS1-14873 R79-23052 RAS1-15006 B79-22000 RAS1-15002 R79-23016 RAS1-15078 R79-23064 RAS1-15078 R79-23064 RAS1-15078 R79-23064 RAS1-15313 R79-22088 RAS2-7007 R79-22039 RAS2-9807 R79-22100 RAS2-10040 R79-22076 RAS3-18520 A79-32351 RAS3-20809 R79-23085 RAS3-20811 R79-23084 RAS4-2498 R79-22040 RAS7-100 R79-23431 RAS8-31294 R79-22040 RAS7-100 R79-23431 RAS8-31294 R79-22062 R79-22063 R79-22064 R79-22065 RSG-3031 R79-22067 RSG-3031 R79-22067 RSG-3133 A79-32329 RO0014-76-C-0114 R79-23094 RSG-3127 R79-22067 RSG-3133 A79-32329 RO0014-78-C-0810 R79-22067 R79-22068 R79-22068 R79-22068 R79-22069 R79-22069 R79-22069 R79-22069 R79-22069 R79-22069 R79-22069 R79-22069 R79-22067 R79-23094 R00019-78-C-0572 R79-23094 R00019-78-C-0572 R79-23082 R00140-77-C-1345 R79-23082 R00140-77-C-1345 R79-23083 R62269-74-C-0577 R79-23083 R62269-74-C-0577 R79-22114 R62269-78-E-8646 R79-22115 RR0141184 R79-22113 RR0141184 R79-22113 RR0141184 R79-22113 RR0141184 R79-22103 RR0141184 R79-22113 RR0141184 R79-22113 S05-03-13-03 R79-22889 S05-00-22 R79-23086 R79-23086 R79-23087 S05-00-31-1 R79-23081 S05-10-3 R79-22037 S05-06-64 R79-22037 S05-09-41 R79-23081 S05-10-23 R79-23080 S13-50-10-23 R79-23080 S13-50-10-23 R79-22038 S16-50-23-01 R79-22038 S16-50-23-01 R79-22038 S16-50-23-01 R79-22088	HASV-	-2800 -12346	A79~35097 A79~34761
RAS1-15006 B79-22000 RAS1-15022 R79-23016 RAS1-15078 R79-23064 RAS1-15078 R79-23064 RAS1-15313 R79-22068 RAS2-7007 R79-22039 RAS2-9807 R79-22100 RAS2-10040 R79-22076 RAS3-18520 A79-32351 RAS3-20801 R79-23085 RAS3-20811 R79-23085 RAS3-20811 R79-23081 RAS4-2498 R79-22040 RAS7-100 R79-23431 RAS6-3129 R79-22062 R79-22063 R79-22065 RSG-3031 R79-22065 RSG-3031 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3134 R79-22067 RSG-3135 R79-22067 RSG-3136 R79-22067 RSG-3137 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3138 R79-23094 RSG-3138 R79-23080 R79-22114 RSG-3186 R79-23115 RSG-10-13-04 R79-22113 RSG-10-13-04 R79-22113 SOS-08-31-1 R79-22057 RF41411000 R79-23115 SOS-09-41 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-23085 SOS-10-3 R79-22087 RF9-23088 RSG-10-3 R79-23080 SOS-11-24 R79-23080	BAS1-	-13500	N79-22046
RAS1-15006 B79-22000 RAS1-15022 R79-23016 RAS1-15078 R79-23064 RAS1-15078 R79-23064 RAS1-15313 R79-22068 RAS2-7007 R79-22039 RAS2-9807 R79-22100 RAS2-10040 R79-22076 RAS3-18520 A79-32351 RAS3-20801 R79-23085 RAS3-20811 R79-23085 RAS3-20811 R79-23081 RAS4-2498 R79-22040 RAS7-100 R79-23431 RAS6-3129 R79-22062 R79-22063 R79-22065 RSG-3031 R79-22065 RSG-3031 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3133 R79-22067 RSG-3134 R79-22067 RSG-3135 R79-22067 RSG-3136 R79-22067 RSG-3137 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-22067 RSG-3138 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3138 R79-23094 RSG-3138 R79-23080 R79-22114 RSG-3186 R79-23115 RSG-10-13-04 R79-22113 RSG-10-13-04 R79-22113 SOS-08-31-1 R79-22057 RF41411000 R79-23115 SOS-09-41 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-22075 RF41411000 R79-23115 SOS-09-31-1 R79-23085 SOS-10-3 R79-22087 RF9-23088 RSG-10-3 R79-23080 SOS-11-24 R79-23080	NAST-	-1451 <i>7</i> -14873	N79-23114 N79-22052
RAS1-15078 RAS1-15078 RAS1-15078 RAS2-7007 RAS2-9807 RAS2-9807 RAS2-9807 RAS2-10040 RAS3-18520 RAS3-20809 RAS3-20801 RAS4-20808 RAS4	HAS1-	-15006	N79~22000
RAS1-15313 R79-22038 RAS2-7007 R79-22039 RAS2-9807 R79-22100 RAS2-10040 R79-22076 RAS3-18520 A79-32351 RAS3-20801 R79-23085 RAS3-20811 R79-23085 RAS3-20811 R79-23081 RAS3-20811 R79-22040 RAS7-100 R79-23431 RAS8-31294 R79-22062 R79-34537 RSG-1018 R79-22063 R79-22063 R79-22064 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22065 RSG-3133 R79-22067 RSG-3133 R79-22087 R79-23094 RSG-3127 R79-23094 RSG-3127 R79-23094 RSG-3133 R79-22087 R79-23094 RSG-3134 R79-22087 R79-23094 RSG-315 R79-22087 R79-23094 RSG-317 R79-23094 RSG-318 R79-22087 R79-23094 RSG-318 R79-22103 R00014-76-C-0710 R79-23061 R00014-78-C-0810 R79-22103 R00019-78-C-0810 R79-23081 R79-22087 R79-23082 R00140-77-C-1345 R79-23082 R0140-77-C-1345 R79-23082 R0140-77-C-1345 R79-23082 R0140-77-C-1345 R79-23082 R014184 R79-22114 R62269-78-E-8646 R79-22115 RR0141184 R79-22114 RR0141184 R79-22115 RR0141184 R79-22113 S05-08-33-12 R79-23085 S05-09-13-11 R79-22057 RF41411000 R79-23115 S05-09-13-11 R79-22057 RF41411000 R79-23115 S05-09-13-11 R79-22057 RF41411000 R79-23115 S05-09-13-11 R79-22038 S05-10-23 R79-23088 S05-10-33 R79-23088 S05-10-33 R79-23088 S05-11-24 R79-23088 S16-50-23-01 R79-22038	NAS1-	-15078	N79-23064
RAS2-9807 H79-22100 RAS2-10040 H79-22076 RAS3-18520 H79-23085 RAS3-20801 H79-23081 RAS3-20811 H79-23084 RAS4-2498 H79-22040 RAS7-100 H79-23431 RAS8-31294 H79-22706 RAS9-3099-270 RASG-1018 H79-23062 RT9-22063 RT9-22063 RT9-22064 RT9-22065 RSG-3031 RT9-22065 RSG-3031 RT9-22065 RSG-3031 RT9-22065 RSG-3137 RT9-22067 RSG-3137 RT9-22067 RSG-3137 RT9-22087 RT9-23094 RSG-3127 RT9-23094 RSG-3127 RT9-23094 RSG-3137 RT9-22103 RO0014-75-C-0113 RT9-22087 RT9-22087 RT9-22087 RT9-22087 RT9-22087 RT9-22087 RT9-22102 R00019-78-C-0572 R00140-77-C-1345 RT9-22087 RT9-22102 R00140-77-C-1345 RT9-22102 R00140-77-C-1345 RT9-22103 RT9-22114 R62269-78-E-8646 RT9-23115 PROJECT SQUID RP1412109 RT9-22103 RT9-22087 RT9-22113 S05-03-13-03 RT9-22087 S05-06-42 RT9-23086 S05-03-13-03 RT9-22037 S05-06-41 RT9-23081 S05-10-33 RT9-23081 S05-10-33 RT9-23088 S13-54-13-02 RT9-23080	NAS1-	-15313	N79-22068
RAS3-18520 A79-23351 NAS3-20809 NAS3-20811 NT9-23085 NAS3-20811 NT9-23081 NAS4-2498 NT9-22040 NT9-23431 NAS8-31294 NT9-22076 NGB-39-009-270 A79-34537 NSG-1018 NT9-23099 NSG-2129 NT9-22063 NT9-22064 A79-22065 NSG-3031 NT9-22065 NSG-3031 NT9-22087 NT9-22087 NT9-22087 NT9-23020 N00014-74-C-0151 NT9-23020 N00014-75-C-1143 A79-32418 N00014-76-C-0710 N79-23061 H00017-73-C-148 NT9-22087 NT9-23061 H00017-73-C-148 NT9-22087 NT9-23081 NT9-22087 NT9-23081 NT9-22087 NT9-23081 NT9-22103 N00014-78-C-0810 NT9-23061 NT9-23081 NT9-23081 NT9-23081 NT9-23082 NT9-23082 NT9-23082 NT9-23082 NT9-23082 NT9-23083 N62269-74-C-0571 NT9-23115 N62269-78-E-8646 NT9-23115 PROJECT SQUID RP1412109 NT9-23115 PROJECT SQUID NT9-23115 S05-04-22 NT9-23085 S05-04-22 NT9-23085 S05-04-21 NT9-23085 S05-09-41 NT9-23085 S05-10-33 NT9-22037 S05-06-64 NT9-22113 S05-09-31-11 NT9-23085 S05-10-33 NT9-22037 S05-09-41 NT9-23085 S05-10-33 NT9-23088 S05-10-33 NT9-23088 S05-11-23-04 NT9-23088 S16-50-23-01 NT9-23088	NASZ-	-7007 -9807	N79-22100
MAS3-20809 N79-23085 hAS3-20811 N79-23084 hAS4-2498 N79-22040 hAS7-100 N79-23431 hAS8-31294 N79-22706 NGB-39-009-270 NSG-1018 N79-23099 HSG-2129 N79-22062 N79-22063 N79-22065 NSG-3031 N79-22065 NSG-3031 N79-22065 NSG-3031 N79-22087 NSG-3127 N79-23094 HSG-3127 N79-23094 HSG-3127 N79-23094 HSG-3127 N79-23094 HSG-3127 N79-23094 HSG-3127 N79-23094 HSG-3137 N79-22087 N79-23001 N00014-75-C-1143 N79-22103 N00014-76-C-0710 N79-23061 H00017-73-C-1418 N79-22087 N79-22087 N79-23094 N00019-74-C-0484 N79-22102 N00019-78-C-0572 N00140-77-C-1345 N79-22102 N00140-77-C-1345 N79-22102 N00140-77-C-1345 N79-22102 N00140-77-C-1345 N79-22102 N00140-77-C-1345 N79-22102 N00140-77-C-0171 N79-22114 H62269-78-E-8646 N79-23115 PROJECT SQUID PR1412109 N79-22113 HRR0141184 N79-22103 N79-22087 N79-22114 H62269-78-E-8646 N79-23115 S05-03-13-03 N79-22809 S05-01-31 N79-22037 S05-06-64 N79-22113 S05-10-3 N79-22037 S05-09-41 N79-22037 S05-09-41 N79-23081 S05-10-23 N79-22038 S05-11-24 N79-23087 S13-50-13-04 N79-23080 S13-50-13-04 N79-22038	HAS2-	-10040	₩79-22076
## NAS	NAS3-	-20809	N79-23085
NASF-100 N79-23431 NASB-31294 N79-22706 NGB-39-009-270 NSG-1018 N79-23099 NSG-2129 N79-22062 N79-22063 N79-22064 N79-22065 NSG-3031 N79-22065 NSG-3031 N79-22087 NSG-3133 N79-22339 NO0014-74-C-0151 N79-23020 N00014-75-C-1143 N79-23020 N00014-76-C-0710 N79-23061 N00014-78-C-0810 N79-22103 N00014-78-C-0810 N79-23061 N00019-74-C-0484 N79-22087 N79-23094 N00019-74-C-0488 N79-23082 N00140-77-C-1345 N79-23082 N00140-77-C-1345 N79-23082 N00140-77-C-1345 N79-23155 N62269-74-C-0577 N79-23082 N6269-74-C-0577 N79-23155 N62269-78-B-8646 N79-23115 PROJECT SQUID RR0141184 N79-22103 N79-22114 N62269-78-B-8646 N79-23115 S05-04-22 N79-23085 S05-03-13-03 N79-22819 S05-04-22 N79-23085 S05-04-22 N79-23085 S05-04-21 N79-22037 S05-06-64 N79-22113 S05-09-41 N79-22037 S05-06-11-23 N79-22038 S05-11-23 N79-22038 S05-11-24 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23085 S13-54-13-02 N79-22038	NAS3-	-20811	N79-23084
NGE-39-009-270 A79-34537 NSG-1018 H79-23099 HSG-2129 H79-22062 H79-22063 H79-22063 H79-22064 H79-22065 H79-22065 H79-22087 H79-22087 H79-22036 HSG-3127 H79-22036 HSG-3133 A79-32329 H00014-74-C-0151 H79-23020 H00014-75-C-1443 H00014-76-C-0710 H00014-76-C-0810 H79-23061 H00017-73-C-1418 H79-22087 H79-23094 H00019-78-C-0820 H00019-78-C-0572 H79-23082 H00019-78-C-0572 H79-23082 H0140-77-C-1345 H79-23082 H0140-77-C-1345 H79-23083 H62269-74-C-0577 H79-2315 H62269-74-C-0577 H79-2315 H62269-78-E-8646 H79-23115 H79-23115 H88-2269-78-E-8646 H79-23115 H79-23020 HP1412109 H79-22057 HF411000 H79-23115 H79-23086 H79-23086 H79-23087 H7	NAS7-	-100	N79-23431
A79-34537 NSG-1018 N79-23099 NSG-2129 N79-22062 N79-22064 N79-22065 NSG-3031 N79-22087 N79-22087 N79-22087 N79-22087 NSG-3133 A79-32329 N00014-74-C-0151 N79-23020 N00014-75-C-1143 N00014-76-C-0710 N79-22103 N00014-76-C-0801 N79-22103 N00014-78-C-0810 N79-22103 N00017-73-C-1418 N79-22103 N00019-74-C-0484 N79-22102 N00019-74-C-0488 N79-22102 N00019-74-C-0572 N79-23082 N00140-77-C-1345 A79-32438 N61339-76-C-0048 N79-22102 N00140-77-C-1345 A79-3263 N62269-74-C-0577 N79-2215 N62269-74-C-0577 N79-2215 N62269-74-C-0577 N79-2215 N62269-78-E-8646 N79-23115 PROJECT SQUID RR0141184 N79-22103 N79-22114 N79-22103 N79-22103 N79-22115 N505-03-13-03 N79-2289 S05-04 N79-22113 S05-04-22 N79-23086 N79-22113 S05-04-21 N79-22037 S05-06-64 N79-22113 S05-01-31 N79-22038 S05-10-3 N79-22038 S05-10-3 N79-22038 S05-11-23-04 N79-23080 S13-55-13-02 N79-22038 S13-55-13-02 N79-22038 S13-55-13-02 N79-22038 S13-50-13-02 N79-22038 S13-55-13-02 N79-22038 S16-50-23-01 N79-22038			
N79-22064 N79-22064 N79-22065 NSG-3031 N79-22087 N79-23094 NSG-3127 N79-22036 NSG-3133 N79-22329 N00014-74-C-0151 N79-23020 N00014-75-C-1143 N00014-76-C-0710 N79-22103 N00014-78-C-0810 N79-22103 N00017-73-C-1418 N79-22087 N79-23094 N00019-74-C-0808 N79-22087 N79-23094 N00019-74-C-0488 N79-22102 N00019-74-C-0572 N79-23082 N00140-77-C-1345 N79-23082 N0140-77-C-1345 N79-23683 N61339-76-C-0048 N79-2215 N62269-74-C-0577 N79-2215 N62269-74-C-0577 N79-2215 N62269-75-C-0171 N79-2215 N62269-78-E-8646 N79-2315 PROJECT SQUID RR0141184 N79-22103 N79-22114 N79-22103 N79-22115 N505-03-13-03 N79-2289 S05-04 N79-22057 NF41411000 N79-23115 S05-03-13-03 N79-2289 S05-06-64 N79-22113 S05-01-21 N79-22037 S05-06-64 N79-22113 S05-10-3 N79-22038 S05-10-3 N79-22038 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-11-24 N79-23088 S13-54-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038 S13-55-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038			A79-34537
N79-22064 N79-22064 N79-22065 NSG-3031 N79-22087 N79-23094 NSG-3127 N79-22036 NSG-3133 N79-22329 N00014-74-C-0151 N79-23020 N00014-75-C-1143 N00014-76-C-0710 N79-22103 N00014-78-C-0810 N79-22103 N00017-73-C-1418 N79-22087 N79-23094 N00019-74-C-0808 N79-22087 N79-23094 N00019-74-C-0488 N79-22102 N00019-74-C-0572 N79-23082 N00140-77-C-1345 N79-23082 N0140-77-C-1345 N79-23683 N61339-76-C-0048 N79-2215 N62269-74-C-0577 N79-2215 N62269-74-C-0577 N79-2215 N62269-75-C-0171 N79-2215 N62269-78-E-8646 N79-2315 PROJECT SQUID RR0141184 N79-22103 N79-22114 N79-22103 N79-22115 N505-03-13-03 N79-2289 S05-04 N79-22057 NF41411000 N79-23115 S05-03-13-03 N79-2289 S05-06-64 N79-22113 S05-01-21 N79-22037 S05-06-64 N79-22113 S05-10-3 N79-22038 S05-10-3 N79-22038 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-10-3 N79-22088 S05-11-24 N79-23088 S13-54-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038 S13-55-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038	NSG-1	1018	N79-23099
#79-22065 #79-22087 #79-23094 #SG-3137 #79-23030 #SG-3133 #79-23020 #SG-3133 #79-23020 #N00014-74-C-01511 #79-23020 #N00014-75-C-1143 #N00014-76-C-0710 #N79-23061 #N00014-78-C-0810 #79-22087 #79-23094 #N00019-74-C-0484 #79-22087 #79-23094 #N00019-74-C-0484 #79-22102 #N00019-78-C-0572 #79-23082 #N00140-77-C-1345 #79-23082 #N61339-76-C-0048 #79-23683 #79-23683 #79-23683 #79-23683 #79-22114 #62269-74-C-0577 #79-23155 #86269-74-C-0711 #79-22114 #62269-78-E-8646 #79-23115 #FROJECT SQUID #P1412109 #79-23115 #FROJECT SQUID #P1412109 #79-23085 #79-23086 #79-23086 #79-23086 #79-23086 #79-23086 #79-23086 #79-23086 #79-23086 #79-23086 #79-23087 #79-22037 #79-22037 #79-22037 #79-22037 #79-23081 #79-23088	B 3 G - 2	. 123	N79-22063
RSG-3031 N79-22087 N79-23094 NSG-3127 N79-23094 NSG-3133 A79-32329 N00014-74-C-0151 N79-23020 N00014-75-C-1143 N79-32418 N00014-76-C-0710 N79-22103 N00014-78-C-0810 N79-22103 N00017-73-C-1418 N79-22087 N79-23094 N00019-74-C-0484 N79-22087 N79-23094 N00019-74-C-0488 N79-22102 N00019-74-C-0488 N79-23082 N00140-77-C-1345 A79-3248 N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-2215 N62269-77-C-0171 N79-2215 N62269-78-E-8646 N79-23115 PROJECT SQUID RR0141184 N79-22103 N79-23115 PROJECT SQUID RR0141184 N79-22103 N79-22118 RR0141184 N79-22103 N79-22118 S05-03-13-03 N79-2289 S05-04-22 N79-23085 S05-06-64 N79-23015 S05-09-41 N79-22037 S05-06-64 N79-22113 S05-09-41 N79-22037 S05-01-31 N79-22038 S05-10-3 N79-22038 S05-10-3 N79-22038 S05-10-3 N79-22038 S05-11-23-04 N79-23088 S13-54-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038 S13-55-13-02 N79-22038 S13-55-13-02 N79-23080 S13-55-13-02 N79-23080 S13-55-13-02 N79-22038			N79-22064
NT9-23094 NSG-3127 NT9-22036 NSG-3133 NT9-32329 N00014-74-C-0151 NT9-23020 N00014-75-C-1143 NT9-22103 N00014-76-C-0710 NT9-22103 N00014-78-C-0810 NT9-22103 N00014-78-C-0810 NT9-22087 NT9-23094 N00019-74-C-0484 NT9-22102 N00019-78-C-072 NT9-23094 N00019-78-C-072 NT9-23082 N00140-77-C-1345 N61339-76-C-0048 NT9-22102 N00140-77-C-1345 N61339-76-C-0048 NT9-2215 N62269-74-C-0577 NT9-2215 N62269-77-C-0171 NT9-22114 N62269-78-E-8646 NT9-23115 PROJECT SQUID RP1412109 NT9-22114 NT9-22103 NT9-22057 NF44411000 NT9-23115 S05-03-13-03 NT9-22085 S05-06-64 NT9-2213 S05-09-41 NT9-22037 S05-09-13-11 NT9-22035 S05-10-23 NT9-23088 NT9-23088 NT9-23088 NT9-23088 NT9-23088 S05-10-23 NT9-23088	NSG-3	3031	N79-22087
R00014-74-C-0151 R79-23020 R00014-75-C-1143 R79-32418 R00014-76-C-0710 R00014-76-C-0710 R79-22103 R00014-78-C-0810 R79-22087 R79-23094 R79-23094 R79-22102 R79-23094 R79-22102 R79-23082 R79-23082 R79-23082 R79-23083 R61339-76-C-0048 R79-23683 R62269-74-C-0577 R79-22215 R62269-77-C-0171 R79-22114 R62269-78-E-8646 R79-23115 RR0141184 R79-22113 RR0141184 R79-22103 R79-23815 R80141184 R79-22103 R79-23815 R0141184 R79-22103 R79-23815 R05-04-22 R79-23086 S05-04-21 R79-23085 S05-04-22 R79-23085 S05-05-04 R79-23085 S05-10-3 R79-23081 S05-10-3 R79-23081 S05-10-3 R79-23081 S05-11-24 R79-23080 S13-50-13-02 R79-23080 S14-52-03-02 R79-22036	11 C C _ 2	1127	N79-23094
#79-23020 #800014-75-C-1143 #879-32418 #800014-76-C-0710 #879-22103 #800014-78-C-0810 #879-22061 #800017-73-C-1418 #879-22087 #879-23094 #879-22102 #879-23094 #879-23094 #879-23094 #879-23082 #879-23082 #879-23082 #879-23082 #879-23083 #861339-76-C-0008 #879-23683 #861339-76-C-0008 #879-23683 #862269-74-C-0577 #862269-77-C-0171 #879-2215 #862269-78-E-8646 #879-23115 #880141184 #879-2213 #880141184 #879-23115 #880141184 #879-23020 #879-23020 #879-23020 #879-23020 #879-23020 #879-23020 #879-23085 #879-23086 #879-23087 #879-23088	NSG-3	3133	A79-32329
N00014-75-C-1143 N00014-76-C-0710 N79-22103 N00014-78-C-0810 N79-23061 N00017-73-C-1418 N79-23061 N79-23061 N79-23061 N79-23061 N79-23061 N79-23082 N00019-74-C-0484 N79-23082 N00019-78-C-0572 N79-23082 N00140-77-C-1345 N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-22215 N62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID N79-23115 PROJECT SQUID N79-23115 PROJECT SQUID N79-23115 S05-03-13-03 N79-2269 N79-23020 NF1412109 N79-23115 S05-04-12 N79-23086 S05-04-12 N79-23086 S05-04-12 N79-23086 S05-05-07-13-11 N79-22037 S05-06-14 N79-23085 S05-10-13-04 N79-23081 S05-10-23 N79-23081 S05-11-24 N79-23085 S05-11-23-04 N79-23081 S05-11-24 N79-23085 S13-54-13-02 N79-23080 S14-52-03-02 N79-22038 S16-50-23-01 N79-22038 S16-50-23-01 N79-22088 S16-50-23-01 N79-23080 S14-52-03-02 N79-22086 S16-50-23-01 N79-22086 S16-50-23-01 N79-22086 S16-50-23-01 N79-22086	N0001	14-74-C-	0151
### ### #### #### ####################	N0001	14-75-C-	1143
R00014-78-C-0810 N79-23061 N00017-73-C-1418 N79-22087 N79-23094 N00019-74-C-0484 N79-22102 N00019-78-C-0572 N79-23082 H00140-77-C-1345 N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-2215 H62269-77-C-0171 N79-2215 H62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID R79-23115 PROJECT SQUID N79-23115 S05-03-13-03 N79-22057 NF4141000 N79-23115 S05-04-22 N79-23086 S05-04-22 N79-23086 S05-04-22 N79-23085 S05-06-64 N79-22113 S05-08-33-12 N79-23085 S05-10-3 N79-22035 S05-10-3 N79-22035 S05-10-3 N79-23088 S05-11-24 N79-23088 S05-11-24 N79-23088 S16-50-23-01 N79-23088 S16-50-23-01 N79-23088 S16-50-23-01 N79-23080 S14-52-03-02 N79-23080 S14-52-03-02 N79-22036	H0001	14-76-C-	0710
### ##################################	R0001	14-78-C-	0810
N79-23094 N00019-74-C-0484 N79-22102 N00019-78-C-0572 N79-23082 N00140-77-C-1345 N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-22215 N62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID RR0141184 N79-22103 N79-23020 NP1412109 N79-23020 NP1412109 N79-2315 S05-03-13-03 N79-2289 S05-04-22 N79-23086 S05-04-22 N79-23086 S05-04-21 N79-23086 S05-04-22 N79-23086 S05-04-21 N79-23085 S05-04-21 N79-23085 S05-05-03-13-04 N79-2213 S05-09-41 N79-23085 S05-10-3 N79-22035 S05-10-3 N79-22035 S05-11-23-04 N79-23085 S13-54-13-02 N79-23085 S13-55-13-02 N79-23085 S13-55-13-02 N79-23085 S13-55-13-02 N79-23085 S13-55-13-02 N79-23085 S13-55-13-02 N79-23086 N79-22038	H0001	17-73-c-	1418
N00019-74-C-0484 N79-22102 N00019-78-C-0572 N79-23082 N00140-77-C-1345 N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-22215 N62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID A79-32418 RR0141184 N79-22103 N79-23020 WP1412109 N79-23115 S05-03-13-03 N79-2289 505-04 N79-23020 N79-23115 S05-06-64 N79-2213 S05-08-33-07 N79-22037 S05-06-64 N79-22133 S05-10-3 N79-22035 S05-10-3 N79-22035 S05-10-3 N79-23081 S05-10-3 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23085 S13-50-13-02 N79-23081 S05-11-24 N79-23085 S13-50-13-02 N79-23085 S13-50-13-02 N79-23085 S13-50-13-02 N79-23085 S13-50-13-02 N79-23085 S13-50-13-02 N79-23085 S13-54-13-02 N79-23085 S13-54-13-02 N79-23080 S14-52-03-02 N79-22038			
N00019-78-C-0572 N79-23082 N00140-77-C-1345 N79-32438 N61339-76-C-0048 N62269-74-C-0577 N79-2215 N62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID N79-23115 PROJECT SQUID N79-23115 PROJECT SQUID N79-23020 NF1412109 N79-23020 NF1412109 N79-2315 505-03-13-03 N79-22849 S05-04 N79-2213 S05-04 N79-2213 S05-04 N79-2213 S05-06-64 N79-2213 S05-08-33-12 N79-22037 S05-06-64 N79-2213 S05-09-41 N79-2213 S05-10-3 N79-22037 S05-10-3 N79-22035 S05-11-23-04 N79-23088 S05-11-23-04 N79-23088 S05-11-23-04 N79-23088 S16-50-33-07 N79-23088 S13-54-13-02 N79-23087 S13-50-13-04 N79-23088 S13-54-13-02 N79-23088 S13-54-13-02 N79-23088 S13-54-13-02 N79-23088 S13-54-13-02 N79-23088 S13-54-13-02 N79-23080 S14-52-03-02 N79-22038	N0001	19-74-C-	0484
#00140-77-C-1345 #79-32438 #61339-76-C-0048 #79-23683 #62269-74-C-0577 #62269-77-C-0171 #79-22215 #62269-78-E-8646 #79-23115 #79-23115 #79-23115 #79-23115 #79-23115 #79-23020 #79-2313 #79-2303 #79-23030 #79-2313 #79-23030 #79-2313 #79-23030 #79-2313 #79-23030 #79-2313 #79-23086 #79-23086 #79-23086 #79-23086 #79-23087 #79-23086 #79-23087 #79-23088	N0001	19-78-C-	0572
N61339-76-C-0048 N79-23683 N62269-74-C-0577 N79-22215 N62269-77-C-0171 N79-22114 N62269-78-E-8646 N79-23115 PROJECT SQUID N79-23115 RR0141184 N79-22103 N79-23020 WP1412109 N79-23115 S05-03-13-03 N79-23248 N79-23020 WP1412109 N79-23115 S05-04-13-03 N79-22689 S05-04 N79-23115 S05-06-64 N79-22113 S05-08-33-07 N79-22689 S05-06-33-07 N79-22037 S05-06-64 N79-22113 S05-09-41 N79-23012 S05-09-41 N79-23081 S05-10-3 N79-23081 S05-10-3 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23081 S05-11-24 N79-23085 S13-54-13-02 N79-23080 S14-52-03-02 N79-23080 S14-52-03-02 N79-23080 S14-52-03-02 N79-23080 S14-52-03-02 N79-22036	H0014	10-77-C-	1345
R62269-74-C-0577 R79-2215 R62269-77-C-0171 R79-22114 R62269-78-E-8646 R79-23115 PROJECT SQUID R79-23020 R7141184 R79-22103 R79-23020 R741411000 R79-23020 R741411000 R79-23115 S05-03-13-03 R79-22057 R741411000 R79-23115 S05-04-22 R79-23086 R79-23086 R79-23086 R79-23086 R79-23087 S05-06-64 R79-22113 S05-08-33-12 R79-23082 S05-09-11 R79-22037 S05-09-41 R79-23081 S05-10-3 R79-23081 S05-10-3 R79-23081 S05-10-3 R79-23081 S05-11-23-04 R79-23081 S05-11-24 R79-23087 S13-50-13-02 R79-23088 S13-54-13-02 R79-23080 S14-52-03-02 R79-23080 S14-52-03-02 R79-23080 S14-52-03-02 R79-23080 S16-50-23-01 R79-23080 S16-50-23-01 R79-22046	N6133	9-76-c-	0048
## ## ## ## ## ## ## ## ## ## ## ## ##	N6226	9-74-C-	0577
## ## ## ## ## ## ## ## ## ## ## ## ##	N6226	9-77-c-	0171
PROJECT SQUID A79-32418 RR0141184 RF0141180 FF1412109 FF41411000 FF2-23020 FF1412109 FF3-23020 FF3-23020 FF3-23020 FF3-23020 FF3-23020 FF3-23020 FF3-22057 FF3-23086 505-04-22 FF3-23086 FF3-23086 FF3-23086 FF3-23086 FF3-23086 FF3-23086 FF3-23086 FF3-23086 FF3-23087 FF3-23012 FF3-23012 FF3-23012 FF3-23013 FF3-23013 FF3-23013 FF3-23013 FF3-23013 FF3-23013 FF3-23087 FF3-23087 FF3-23080	N6226	9-78-E-	8646
RR0141184	PROJE	CT SQUI	Ð
WP142109 W79-22057 WP41411000 W79-23115 505-03-13-03 W79-22548 505-04 W79-23086 505-06-33-07 W79-22037 505-06-66-4 W79-22113 505-08-33-12 W79-22113 505-09-11 W79-23008 505-10-3 W79-23081 505-10-23 W79-23081 505-11-23-04 W79-23081 505-11-23-04 W79-23013 505-11-24 W79-23013 513-50-13-02 W79-22038 513-54-13-02 W79-22038 514-52-03-02 W79-22038 516-50-23-01 W79-22046 W79-22101 W79-22010	RR014	1184	N79-22103
NF41411000 'N79-23115 505-03-13-03 N79-22849 505-04-22 N79-23086 505-06-33-07 N79-22037 505-06-64 N79-22113 505-09-13-11 N79-23012 505-09-41 N79-23035 505-10-3 N79-23081 505-10-3 N79-23088 505-10-3 N79-23088 505-11-23-04 N79-23088 505-11-23-04 N79-23098 505-11-24 N79-23013 513-50-13-02 N79-23080 513-54-13-02 N79-23080 514-52-03-02 N79-22038 516-50-23-01 N79-22046 N79-22011 N79-22016	WP141	2109	N79-22057
505-04 N79-22518 N79-23086 505-04-22 N79-23085 505-06-33-07 N79-22037 505-06-64 N79-22113 505-09-13-11 N79-23078 505-10-3 N79-22035 505-10-3 N79-23081 505-10-23 N79-23081 505-11-23-04 N79-23081 505-11-24 N79-23013 505-11-24 N79-23087 513-50-13-02 N79-22088 513-54-13-02 N79-22038 514-52-03-02 N79-22038 516-50-23-01 N79-22046 N79-22011	RP414	11000	'X79-23115
505-04-22			N79-22518
505-06-33-07 N79-22037 505-06-64 N79-22113 505-08-33-12 N79-23012 505-09-13-11 N79-23754 505-10-3 N79-2308 505-10-13-04 N79-23081 505-10-23 N79-23081 505-11-23-04 N79-23013 505-11-23-04 N79-23013 505-11-24 N79-23087 513-50-13-02 N79-23080 514-52-03-02 N79-22038 516-50-23-01 N79-22046 N79-2201			N79-23086
505-06-64 N79-22113 505-08-33-12 N79-23012 505-09-13-11 N79-23058 505-10-3 N79-23081 505-10-3 N79-23081 505-10-23 N79-23081 505-11-23-04 N79-23081 505-11-24 N79-23013 505-11-24 N79-23087 513-50-13-02 N79-22088 513-54-13-02 N79-23080 514-52-03-02 N79-22038 516-50-23-01 N79-22046 N79-2201	505-0	6-33-07	N79-22037
505-09-41	505-0	16-64	N79-22113
505-09-41	505-0	18-33-12 19-13-11	N79-23012 N79-23754
505-10-13-04	505-0	9-41	N79-23008
505-10-23	505-1	0-3	N79-22035
505-11-23-04	505-1	0-23	N79-23098
505-11-24	505-1	1-23-04	N79-22051
513-50-13-02 R79-22783 513-54-13-02 R79-23080 514-52-03-02 R79-22038 516-50-23-01 R79-22046 R79-22101	505-1	1-24	
516-50-23-01 N79-22046 N79-22101	513-5	0-13-02	N79-22783
516-50-23-01 N79-22046 N79-22101	514-5	2-03-02	N79-22038
791-40-13-01 N79-22061	516-5	0-23-01	N79-22046
	791-4	0-13-01	N79-22101

791-40-41 N79-22062 N79-22063 N79-22064

1 Report NASA	。 SP-7037 (112) 、	2 Government Access	sion No	3 Recipient's Catalog	No
4 Title and				5 Report Date	
L	NAUTICAL ENGINEERING			August 1979	
A Co	ntinuing Bibliograph	ny (Supplement	t 112)	6 Performing Organiz	ation Code
7 Author(s				8 Performing Organiza	ation Report No
				10. Work Unit No	
9 Performi	g Organization Name and Address				
	onal Aeronautics and ington, D. C. 2054		stration	11. Contract or Grant13 Type of Report an	
12 Sponsoru	ng Agency Name and Address			13 Type of Report an	d renod Covered
12 57050	g rigonoy rome and riverious		Ļ		
				14 Sponsoring Agency	Code
15 Supplem	entary Notes				· · · · · · · · · · · · · · · · · · ·
				~	
16 Abstract	· · · · · · · · · · · · · · · · · · ·		·	·	
i	nis bibliography,li ntroduced into the I n July 1979.				
	ø				
	٠				
)				•	
1					
17 Key Wo	ds (Suggested by Author(s))		18 Distribution Statement		
	ynamics				
h .	autical Engineering		1		
	autics		Unclassif	ied - Unlimite	ed
	ographies		,		
19 Security	Classif (of this report)	20 Security Classif (d	of this page)	21 No of Pages	22 Price* E02
Uncla	sified Unclassified		130	\$4.75 HC	

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to ten special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA

University of California, Berkeley

COLORADO

University of Colorado, Boulder

DISTRICT OF COLUMBIA

Library of Congress

GEORGIA

Georgia Institute of Technology, Atlanta

ILLINOIS

The John Crerar Library, Chicago

MASSACHUSETTS

Massachusetts Institute of Technology. Cambridge

MISSOURI

Linda Hall Library, Kansas City

NEW YORK

Columbia University, New York

PENNSYLVANIA

Carnegie Library of Pittsburgh

WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries

CALIFORNIA

Los Angeles Public Library San Diego Public Library

COLORADO

Denver Public Library

CONNECTICUT

Hartford Public Library

MARYLAND

Enoch Pratt Free Library, Baltimore

MASSACHUSETTS

Boston Public Library

MICHIGAN

Detroit Public Library

MINNESOTA

Minneapolis Public Library

MISSOURI

Kansas City Public Library

St Louis Public Library

NEW JERSEY

Trenton Public Library

NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

OHIO

Akron Public Library

Cincinnati Public Library

Cleveland Public Library

Dayton Public Library

Toledo Public Library

OKLAHOMA

Oklahoma County Libraries, Oklahoma City

TENNESSEE

Memphis Public Library

TEXAS

Dallas Public Library

Fort Worth Public Library

WASHINGTON

Seattle Public Library

WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR* European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from ESRO/ELDO Space Documentation Service. European Space Research Organization, 114, av Charles de Gaulle, 92-Neuilly-sur-Seine, France

National Aeronautics and Space Administration

Washington, D.C. 20546

Official Business
Penalty for Private Use, \$300

THIRD-CLASS BULK RATE

Postage and Fees Paid National Aeronautics and Space Administration NASA-451



NASA

POSTMASTER.

If Undeliverable (Section 158 Postal Manual) Do Not Return

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546