

APRIL 1996

NUMBER 96-01

January 1, 1996 through March 31, 1996

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19960003395; 96N13404 Advisory Group for Aerospace Research and Development, Guidance Control Panel., Neuilly-Sur-Seine, France

Aerospace navigation systems *Les systemes de navigation aérospatiaux*

Niemela, John, editor, Army Communications-Electronics Command, United States; Jun 1, 1995, 425p; In English; Also announced as N96-13405 through N96-13422

Report No.(s): AGARD-AG-331; ISBN-92-836-1018-0; Copyright; Avail: CASI; A18 Hardcopy; A04 Microfiche

The need for an up to date, comprehensive treatise on aerospace navigation systems has been recognized. It is anticipated that the target reader of this AGARDograph will be an individual who has the responsibility for the integration of navigation equipment aboard an aerospace vehicle. The AGARDograph is organized into six sections detailing the the motivation for establishing the requirements to assure that the development of an aerospace navigation system will meet its operational requirement; reviewing the navigation coordinate frames with a discussion of inertial, terrestrial, and geodetic coordinate systems; describing modern navigation sensor technologies; addressing the system analysis and synthesis methods; representing state-of-the-art navigation system implementations in different aircraft; and describing various test methods used to verify the performance of aerospace navigation systems used in NATO countries.

AIR NAVIGATION; DOPPLER NAVIGATION; INERTIAL NAVIGATION; NAVIGATION AIDS; NAVIGATION INSTRUMENTS; RADAR NAVIGATION; REMOTE SENSORS; SATELLITE NAVIGATION SYSTEMS; SPACE NAVIGATION; SYSTEMS ANALYSIS; TECHNOLOGY ASSESSMENT

19960003572; 96N13582 Advisory Group for Aerospace Research and Development, Fluid Dynamics Panel., Neuilly-Sur-Seine, France

Aerodynamics and Aeroacoustics of Rotorcraft *L'Aérodynamique et l'Aéroacoustique des Aeronefs a Voilure Tournante*

Aug 1, 1995, 489p; In English; In French; 75th Symposium, 10-13 Oct. 1994, Berlin, Germany; Also announced as N96-13583 through N96-13617

Report No.(s): AGARD-CP-552; ISBN-92-836-0015-0; Copyright; Avail: CASI; A21 Hardcopy; A04 Microfiche; Original contains color illustrations

The papers prepared for the AGARD Fluid Dynamics Panel (FDP) Symposium on 'Aerodynamics and Aeroacoustics of Rotorcraft', which was held 10-13 October 1994 in Berlin, Germany are contained in this Report. In addition, a Technical Evaluator's Report aimed at assessing the success of the Symposium in meeting its objectives, and an edited transcript of the General Discussion held at the end of the Symposium are also included. The Symposium brought together scientists in different fields of aerodynamics and aeroacoustics to review and discuss their recent results in the area of rotary-wing aircraft in order to foster future development. The program included 35 papers from North American, Western Europe, and Russian organized in the following technical sessions: Dynamics Stall, Wind Turbines, Aerodynamic 3D Prediction Methods, Experimental Investigations of Helicopter Rotors, Acoustic Predictions Methods, and Interference Problems.

AEROACOUSTICS; AERODYNAMIC STALLING; BLADE-VORTEX INTERACTION; COMPUTATIONAL FLUID DYNAMICS; CONFERENCES; HELICOPTERS; HOVERING; NAVIER-STOKES EQUATION; NOISE PREDICTION (AIR-

CRAFT); *ROTARY WINGS*; *ROTOR AERODYNAMICS*; *ROTOR BLADES*; *WIND TURBINES*

19960003850; 96N13860 Advisory Group for Aerospace Research and Development, Sensor and Propagation Panel., Neuilly-Sur-Seine, France

High Power Microwaves (HPM), Volume 1 *Les Micro-ondes de Forte Puissance (MFP)*

Mar 1, 1995, 277p; In English; In French; Sensor and Propagation Panel Symposium, 2-5 May 1994, Ottawa, Ontario, Canada; Also announced as N96-13861 through N96-13890 Report No.(s): AGARD-CP-564-VOL-1; Copyright; Avail: CASI; A13 Hardcopy; A03 Microfiche; Original contains color illustrations

This publication contains the unclassified papers presented to a specialists' meeting sponsored jointly by the Sensor and Propagation Panel and the Defence Research Group (DRG) of NATO. The topics covered in that meeting on the subject of 'High Power Micro-Waves (HPM)' included these: (1) High Peak Power Generators; (2) Transmission Line and Antenna Peak Power Handling; (3) Atmospheric Microwave Breakdown; (4) Target Coupling Mechanisms; (5) Components and Subsystems Vulnerability; (6) Hardening Against HPM; and (7) Test Facilities.

CONFERENCES; ELECTRIC GENERATORS; ELECTROMAGNETISM; ELECTRONIC WARFARE; MICROWAVE ANTENNAS; MICROWAVE EQUIPMENT; MICROWAVES; TRANSMISSION LINES

19960003881; 96N13891 Advisory Group for Aerospace Research and Development, Flight Vehicle Integration Panel., Neuilly-Sur-Seine, France

Space systems design and development testing *Les essais dans la conception et le developpement des systemes spatiaux*

Mar 1, 1995, 309p; In English; In French; Flight Vehicle Integration Panel Symposium, 3-6 Oct. 1994, Cannes, France; Also announced as N96-13892 through N96-13919 Report No.(s): AGARD-CP-561; ISBN-92-836-0014-2; Copyright; Avail: CASI; A14 Hardcopy; A03 Microfiche

In view of the importance of space capability to the fulfillment of future NATO requirements, the Flight Vehicle Integration Panel of AGARD has placed increased emphasis on space technology. The goal of the symposium reported in this document was to permit information exchange and discussion on the test aspects of space systems design and development with the emphasis on systems related to anticipated future capabilities and the importance of adequate testing, and continued with six sessions comprising 28 technical papers in all. These sessions focused on: Testing Requirements and Practices; Flight Dynamics and Flexible/Deployable Structures; Systems Development and Evaluation; Simulation; Space Flight Experiments; and Test Facilities and Support.
AEROSPACE ENGINEERING; AEROSPACE SYSTEMS;

CONFERENCES; NORTH ATLANTIC TREATY ORGANIZATION (NATO); SPACE FLIGHT; SPACECRAFT; SPACECRAFT DESIGN; SYSTEMS ENGINEERING; TESTS

19960007226; 96N14391 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Propagation Assessment in Coastal Environments *l'Evaluation de la propagation en regions cotieres*

Feb 1, 1995, 345p; In English; In French; Sensor and Propagation Panel Symposium, 19-22 Sep. 1994, Bremerhaven, Germany; Also announced as N96-14392 through N96-14427 Report No.(s): AGARD-CP-567; ISBN-92-836-0013-4; Copyright; Avail: CASI; A15 Hardcopy; A03 Microfiche

This publication reports the unclassified papers at a specialists' meeting held by the Sensor and Propagation Panel at its Fall 1994 meeting. The topics covered on the occasion of that symposium on the subject of 'Propagation Assessment in Coastal Environments' included: (1) Radio Propagation Modeling; (2) Electro-optical Propagation Modeling; (3) Remote and Direct Sensor and Sensing Techniques; (4) Modeling and Prediction of the Propagation Environment; (5) Sensor Technology and Systems Aspects; and (6) Measurement Campaigns.

COASTS; CONFERENCES; ELECTRO-OPTICS; MARINE ENVIRONMENTS; RADIO TRANSMISSION; REMOTE SENSORS; WAVE PROPAGATION

19960007294; 96N14459 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Guide to multimedia storage *Le guide des memoires multimedia*

Sep 1, 1995, 92p; In English

Report No.(s): AGARD-AR-341; NIPS-95-06086; ISBN-92-836-1024-5; Avail: CASI; A05 Hardcopy; A01 Microfiche

The guide to multimedia is a review of the current storage devices available for accessing, retrieving, and storing information. The discussion addresses the principal devices available. A selected bibliography is provided as a reference tool for further inquiry. The type of multimedia devices used in an information storage and retrieval environment will vary with the size of the collection, the demand for information, and the retrieval capability required. While there are several methods of storage available, ease of access, cost, reading and writing capabilities, and durability are a few of the issues that should be addressed in determining the needs of an information center. This guide provides information on twelve major storage devices. A description is provided on their benefits, limitations, durability, platform capabilities, comparison, storage capacity, physical characteristics, data capacity, ease of use, copying capability, cataloguing rules and data standards. There are three major groupings to this guide. The first is optical storage capability. CD-ROM, optical disk, and photo CD are reviewed. The second is magnetic storage. This grouping

includes magnetic tape, video tape, tape cassette and cartridge, floppy disk, hard disk, and removable storage systems. The third grouping is defined as other media storage. Photo media, audio material and motion picture comprise this group. Regardless of the storage device used, the key is effective management to enable immediate access to information when required.

Author

DATA ACQUISITION; DATA STORAGE; INFORMATION MANAGEMENT; INFORMATION RETRIEVAL; MAGNETIC STORAGE; MULTIMEDIA; OPTICAL MEMORY (DATA STORAGE)

19960008040; 96N15206 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Aerodynamics of 3-D aircraft afterbodies *L'Aerodynamique des arriere-corps tridimensionnels*

Sep 1, 1995, 479p; In English

Report No.(s): AGARD-AR-318; NIPS-95-06219; ISBN-92-836-1023-7; Avail: CASI; A21 Hardcopy; A04 Microfiche

This report presents the findings of a study performed by AGARD Working Group 17 into the current understanding of the aerodynamics of complex 3-D aircraft afterbodies and the status of the methods now available to aid in their design optimization. The major part of the report is given over to the results obtained and lessons learned from the application of current CFD procedures to a selection of test cases ranging in complexity from a simple axisymmetric body with jet to a twin jet body complete with wings and empennage. Comprehensive descriptions of the selected test cases with their experimental data bases are appended to the report in the hope that these will continue to serve other researchers in the field. Other sections of the report review the developments made in empirical/semi-empirical procedures and in the experimental techniques applicable to support both future computational developments and aid directly in the task of aircraft design optimization.

CASI

AERODYNAMIC CHARACTERISTICS; AFTERBODIES; AIRCRAFT DESIGN; DESIGN ANALYSIS; OPTIMIZATION; THREE DIMENSIONAL BODIES; THREE DIMENSIONAL FLOW

19960008173; 96N15339 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Recommended practices for the assessment of the effects of atmospheric water ingestion on the performance and operability of gas turbine engines *Recommandations concernant les methodes a utiliser pour le traitement de l'humidite dans les turbines a gaz*

Sep 1, 1995, 364p; In English

Report No.(s): AGARD-AR-332; NIPS-95-06172; ISBN-92-836-1022-9; Avail: CASI; A16 Hardcopy; A03 Microfiche

The ingestion of water from the atmosphere into the inlet of a gas turbine can significantly influence the performance and operability of the engine. The objective of this report is to identify preferred practices to measure the effect of water ingestion on engine performance and operability. Atmospheric water is considered in all its forms; gaseous humidity, condensation droplets, rain, snow, and hail. The Introduction to Chapter 1 summarizes the purpose and background to the report and identifies the intended audience. Chapter 2 provides a quantitative assessment of the hazardous weather threat due to water for all types of aircraft using data collected from international sources. Chapters 3, 4, and 5 examine analytical and experimental techniques currently in use to measure and to predict the effects of the different forms of ingested water on engine performance and operability. Chapter 6 summarizes current acceptance and certification specifications used by different national agencies in assessing the effects of ingested water. In Chapter 7 a review is made of current instrumentation used to assess and quantify the presence of vapor, liquid droplets, and particles (frozen droplets) in the flow. Chapter 8 describes briefly current methods for testing gas turbine engines under typical weather threat conditions. The final chapter of the report summarizes the collected information on the effects of water ingestion from the preceding chapters and presents a set of conclusions and recommendations for future research.

Author

ATMOSPHERIC MOISTURE; CONDENSATION; DROPS (LIQUIDS); ENGINE INLETS; FLIGHT HAZARDS; GAS TURBINE ENGINES; INGESTION (ENGINES); PERFORMANCE; WATER VAPOR

19960008186; 96N15352 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Optical Processing and Computing *Le traitement optique de donnees et l'informatique*

Sep 1, 1995, 147p; In English; In French; AGARD SPP Lecture Series on Optical Processing and Computing, 19-20 Oct. 1995, Paris, Rome, Ankara, France, Italy, Turkey; Also announced as N96-15353 through N96-15357; Submitted for publication in AGARD LS-199

Report No.(s): AGARD-LS-199; NIPS-95-06213; ISBN-92-836-0018-5; Avail: CASI; A07 Hardcopy; A02 Microfiche

Optical computing possesses some inherent advantages over electronic computing, in particular for massive data storage and parallel and neural processing. The main aim of this lecture is to show how recent advances in lightwave technology make the time ripe to consider exploiting the potential of optical computing for data processing applications. An overview is presented of the basic concepts and inherent advantages of using optics for data processing and computing applications. The use of optics for interconnecting electronic and optoelectronic processors and the use of optoelectronic techniques to enhance the performance of various computing

devices and systems are discussed. An overview is given of the emerging field of artificial neural networks as a signal processing paradigm and their optical implementations. Recent developments in optoelectronic data communication are described.

Author (revised)

ELECTRO-OPTICS; OPTICAL COMPUTERS; OPTICAL DATA PROCESSING; OPTICAL MEMORY (DATA STORAGE); OPTOELECTRONIC DEVICES; PHOTONICS; SIGNAL PROCESSING

19960008937; 96N16103 Advisory Group for Aerospace Research and Development, Propulsion and Energetics Panel., Neuilly-Sur-Seine, France

Environmental Aspects of Rocket and Gun Propulsion *Les aspects environnementaux de la propulsion par fusée et des canons*

Feb 1, 1995, 351p; In English; In French; Propulsion and Energetics Panel (PEP) 84th Symposium, 29 Aug. - 2 Sep. 1994, Aalesund, Norway; Also announced as N96-16104 through N96-16138

Report No.(s): AGARD-CP-559; Copyright; Avail: CASI; A16 Hardcopy; A03 Microfiche; Original contains color illustrations

The Conference Proceedings contains papers presented at the Propulsion and Energetics Panel 84th Symposium on Environmental Aspects of Rocket and Gun Propulsion which was held on 29 Aug. -2 Sept 1994, in Aalesund, Norway. The Technical Evaluation Report and the Keynote Address are included at the beginning and discussions follow most papers. The Symposium was arranged in the following sessions: Clean Propellants (7); Propellant Development (6); Measurements (7); Disposal (3); Material Recovery and Re-Use (8); Contamination (5).

CONFERENCES; CONTAMINATION; ENVIRONMENT EFFECTS; ENVIRONMENT PROTECTION; GUN PROPELLANTS; MATERIALS RECOVERY; PROPELLANT TESTS; ROCKET EXHAUST; SOLID PROPELLANT COMBUSTION; SOLID PROPELLANTS; SOLID ROCKET PROPELLANTS

19960009081; 96N16247 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Special Course on Parallel Computing in CFD *L'Aérodynamique numérique et le calcul en parallèle*

Oct 1, 1995, 346p; In English; Also announced as N96-16248 through N96-16255; Prepared in cooperation with Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium)

Report No.(s): AGARD-R-807; NIPS-95-06204; ISBN-92-836-1025-3; Avail: CASI; A15 Hardcopy; A03 Microfiche

Lecture notes for the AGARD Fluid Dynamics Panel (FDP) Special Course on 'Parallel Computing in CFD' have been assembled in this report. The aim and scope of this

Course was to present and discuss the latest advances and future trends in the application of parallel computing to solve computationally intensive problems in computational fluid dynamics (CFD). Topics in this lecture series focus on the increasingly sophisticated types of architectures now available, and how to exploit these architectures by appropriate algorithms for the simulation of fluid flow. Some of the subjects discussed are: parallel algorithms for computing compressible and incompressible flow; domain decomposition algorithms and partitioning techniques; and parallel algorithms for solving linear systems arising from the discretized partial differential equations.

Author (revised)

ALGORITHMS; COMPUTATIONAL FLUID DYNAMICS; PARALLEL PROCESSING (COMPUTERS)

19960012290; 96N18527 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Knowledge-Based Functions in Aerospace Systems *Systèmes de Guidage et de Pilotage Aérospatiaux à Base de Systèmes Experts*

Nov 1, 1995, 150p; In English, Lecture Series; 6-7 Nov. 1995, Madrid, Spain; 9-11 Nov. 1995, Chatillon, France; 16-17 Nov. 1995, Moffett Field, CA, United States; Also announced as N96-18528 through N96-18533

Report No.(s): AGARD-LS-200; NIPS-96-07993; ISBN-92-836-1026-1; Avail: CASI; A07 Hardcopy; A02 Microfiche

In aerospace systems classical control technology has enabled the transfer of functions of the human operator to machines which need not be based on the explicit evaluation of knowledge. Symbolic data processing, neural networks and the techniques of artificial intelligence now permit the design of automatic systems which can explicitly make use of knowledge stored in computers. The Lecture Series presents a conceptual framework for the automation of knowledge-based control and management functions in aerospace systems, which are usually carried out by human operators. It describes the structure of these functions, discusses successful examples of application and gives recommendations for further studies.

Author

AEROSPACE SYSTEMS; AIR TRAFFIC CONTROL; AUTOMATIC CONTROL; CONFERENCES; CONTROL SYSTEMS DESIGN; EXPERT SYSTEMS; FLIGHT CONTROL; KNOWLEDGE BASES (ARTIFICIAL INTELLIGENCE)