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19960033256; 96N30060 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

Integrated vehicle management systems

Apr. 1996, 144p; In English

Report No.(s): AGARD-AR-343; ISBN 92-836-1035-0; Copyright Waived; Avail: CASI; A07 Hardcopy; A02 Microfiche

Major trends in technology, weapon system performance goals and affordability for aerospace systems are occurring simultaneously. For avionic systems this performance and affordability can be achieved by functional and physical integration. 'Functionally' integrated subsystems to achieve higher performance has been greatly aided by advances in computer technology. The desire to minimize costs for these systems has been accomplished through a 'physical' integration concept based upon common modules tied through a high speed backplane. The concept, called integrated avionics, has been used on new aircraft such as the US Air Force F-22 fighter and the Boeing 777 commercial transport. Vehicle management systems provide the management of crucial flight functions and systems for advanced aerospace vehicles. These systems must have high integrity, safety, and overall fault tolerance. Low cost modular avionics are unproven for such fault tolerant systems. This becomes a key issue for investigation. This report deals with the key problems in fault tolerance for modular computer based systems. New techniques, only recently applied, provide exciting possibilities to reduce avionics costs and maintain high integrity and safety. These techniques and more are discussed in this report sponsored by the Mission Systems Panel of the AGARD.

Author

Fault Tolerance; Functional Integration; Avionics; Cost Reduction; Modularity; Aircraft Design; Flight Control; Computer Aided Design; Systems Health Monitoring

19960029445; 96N29863 Advisory Group for Aerospace Research and Development, Fluid Dynamics Panel., Neuilly-Sur-Seine, France

Hypersonic Experimental and Computational Capability, Improvement and Validation, Volume 1 ***l'Hypersonique experimentale et de calcul - Capacite, amelioration et validation***

Saric, William S., Editor, Arizona State Univ., USA; Muylaert, Jean, Editor, European Space Agency. European Space Research and Technology Center, ESTEC, Netherlands; Dujarric, Christian, Editor, European Space Agency, France; May 1996, 209p; In English

Report No.(s): AGARD-AR-319-Vol-1; ISBN-92-836-1037-7; Copyright Waived; Avail: CASI; A10 Hardcopy; A03 Microfiche

The results of the phase 1 effort conducted under AGARD Working Group 18 on Hypersonic Experimental and Computational Capability, Improvement and Validation are presented in this report. A discussion of issues and problems classified into seven topic areas precedes the individual sections on Shock/Boundary-Layer Interactions, Laminar-Turbulent Transition, Rarefield Flow, Real-Gas Effects, Facility Calibration Procedures, Extrapolation to Flight and Hypersonic Test Facilities. Recommendations for future work in these areas is included at the end of each section. Conclusions for the work conducted during the phase 2 of this Working Group will be presented in Volume 2.

Author

Hypersonics; Shock Wave Interaction; Transition Flow; Boundary Layer Transition; Calibrating; Computational Fluid Dynamics; Test Facilities; Gas Dynamics; Research Facilities; Hypersonic Flow

19960026141; 96N27869 Advisory Group for Aerospace Research and Development, Flight Vehicle Integration Panel., Neuilly-Sur-Seine, France

Flight Vehicle Integration Panel Working Group 21 on Glass Cockpit Operational Effectiveness ***L'Efficacite operationnelle du poste de pilotage en verre***

Apr. 1996, 192p; In English; Original contains color illustrations

Report No.(s): AGARD-AR-349; ISBN 92-836-1034-2; Copyright Waived; Avail: CASI; A09 Hardcopy; A02 Microfiche

The members of AGARD FMP Working Group 21, representing aircraft manufacturers, research institutions and operational organizations, met over a two year period, 1993-1995 to address the following objective: Summarize the status of current cockpits, highlight their benefits and weaknesses, and provide guidance for future cockpit design. This report, the result of those meetings, is structured around the series of questions listed below: (1) What are the pilot and crew required to do to complete a mission successfully; (2a) What do the current glass cockpits consist of; (2b) What are some of the technological highlights and trends of these cockpits; (3) What new technologies are becoming available; (4) How can we tailor the cockpit to be the most suitable for the human operator; (5) How can and how does the use of glass cockpits change the required aircrew training process; (6) What are the key problem issues with the current design process and what suggestions can be made to improve it and; (7) What are the cockpit concepts being considered to improve the operational effectiveness of future aircraft. With consideration of the human factors issues in design as a major basis for this report, this document provides an in depth discussion of the cockpit of today's aircraft and can serve as a foundation upon which to develop a more optimized pilot-vehicle-system interface of tomorrow.

Author

Fighter Aircraft; Helicopters; Cockpits; Human Factors Engineering; Man Machine Systems

19960025214; 96N27294 Advisory Group for Aerospace Research and Development, NATO, The Aerospace Medical Panel., Neuilly-Sur-Seine, France

Aircraft Disinsection: A Guide for Military & Civilian Air Carriers ***Desinsectisation des aeronefs: Un guide a l'intention des responsables des transports aeriens civils et militaires***

Ellis, R. A., Advisory Group for Aerospace Research and, Development, France; Apr. 1996, 84p; In English

Report No.(s): AGARD-AG-340; ISBN 92-836-1036-9; Copyright Waived; Avail: CASI; A05 Hardcopy; A01 Microfiche

Aircraft disinsection is an important tool in preventing the introduction of unwanted pests into a country when an aircraft is returning to its home base. To prevent risks to air crew health, aircraft safety, and industry, Canada's Department of National Defence (DND) has reviewed the importance of aircraft disinsection and the potential problems associated with execution. Over the past two decades, various directives for air crew maintenance personnel, and preventive medicine technicians have been developed and updated periodically. This aircraft disinsection review is part of the latest effort to revise DND's administrative orders on aircraft disinsection. Existing Canadian and foreign legislation, regulations, and recommendations dealing with aircraft disinsection were reviewed. This review also summarises the information that was gathered from various officials involved in the regulation of introduced pests, pesticide registration, and safe pesticide use. Aircraft disinsection technology has evolved over the years since its inception. Practical, up-to-date information on current technologies was gathered, through numerous meetings and correspondence, from researchers, private companies involved in aircraft disinsection, air force personnel, and representatives of civilian air carriers who are active worldwide. The end-result was the development of a current, standard operating procedure for disinsection of Canadian Air Force aircraft in the form of an Air Command Administrative Order. It may serve as a model for the Air Forces and air carriers of other NATO countries.

Author

Military Aircraft; Decontamination; Commercial Aircraft; Insects; Aircraft Maintenance; Regulations

19960024804; 96N26963 Advisory Group for Aerospace Research and Development, Propulsion and Energetics Panel., Neuilly-Sur-Seine, France

Loss Mechanisms and Unsteady Flows in Turbomachines ***Les mecanismes des pertes et les ecoulements instationnaires dans les turbomachines***

Jan. 1996, 578p; In English; In French; 85th; Propulsion and Energetics Panel Symposium, 8-12 May 1995, Derby, UK; Also announced as 19960024804 through 19960024846; Original contains color illustrations

Report No.(s): AGARD-CP-571; ISBN-92-836-0020-7; Copyright Waived; Avail: CASI; A25 Hardcopy; A06 Microfiche

The Conference Proceedings contains 42 papers presented at the Propulsion and Energetics Panel 85th Symposium on Loss Mechanisms and Unsteady Flows in Turbomachines which was held from 8-12 May 1995, in Derby, UK. Sessions: Cascade Steady Flow Mechanisms and Losses (9 papers); Steady Flow Clearance and Injection Flow Mechanisms and Losses (6); Steady Secondary Flows and Shock Boundary Layer Interaction (3); Blade Section-Wake Boundary layer Interaction (6); Management of Unsteady Flows (10); Blade Interactions (8). The Symposium contributes to improving the efficiency and operation of turbomachinery also in off-design conditions by application of experimental and computational fluid dynamics methods. Multi-stage methods and positive

loss management in the design stage have been identified as next steps. This will yield optimized engines of high efficiency for expanded flight envelopes including active control of the plane movement at high reliability levels.
Author
Computational Fluid Dynamics; Boundary Layer Transition; Shock Layers; Engine Design; Aircraft Engines; Turbomachinery

19960023107; 96N25906 Advisory Group for Aerospace Research and Development, Aerospace Medical Panel., Neuilly-Sur-Seine, France
Situation Awareness: Limitations and Enhancement in the Aviation Environment ***la Conscience de la situation: les Limitations et l'amelioration en environnement aeronautique***
Jan. 1996, 272p; In English; In French; Aerospace Medical Panel Symposium, 24-27 Apr. 1995, Brussels, Belgium; Also announced as 19960023107 through 19960023133
Report No.(s): AGARD-CP-575; ISBN-92-836-0021-5; Copyright Waived; Avail: CASI; A12 Hardcopy; A03 Microfiche

These proceedings include the Technical Evaluation Report, two keynote addresses and 25 papers from the Symposium sponsored by the Aerospace Medical Panel and held in Brussels, Belgium 24-27 April 1995. Situational Awareness is seen as key to mission success and aircraft safety. There are several questions that the Symposium addressed: how effectively Situation Awareness can be measured, whether it is possible to select for it and whether training strategies can improve it. The Symposium also examined the research carried out into the contribution of new Cockpit Technologies to enhance it. Loss of Situation Awareness has been the predominant cause of fatal accidents in both military and civil aviation and several examples were cited where the aircraft had been lost or put in jeopardy due to pilot error. These proceedings will be of interest to those involved in cockpit system design, human performance, human perception, cognition and accident investigation.
Author
Aircraft Safety; Accident Investigation; Cockpits; Human Performance; Systems Engineering