AGARD and RTO Technical Publications: a quarterly listing

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This is a listing of unclassified AGARD and RTO technical publications NASA received and announced in the NASA STI Database during the quarter cited above. Requests for reports on the list may be made by document identification number (19990026320) from the NASA Center for AeroSpace Information, 7121 Standard Drive, Hanover, MD 21076-1320. Requests may also be made by e-mail ***help@sti.nasa.gov***, fax (301) 621-0134, or telephone (301) 621-0390. Where stock permits, requests will be filled with printed copies; if printed copies are not available, microfiche copies will be supplied. This listing can also be viewed and downloaded via the NASA STI Program website at *<http://www.sti.nasa.gov>*.

19990026320 Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
Fatigue in the Presence of Corrosion ***Fatigue sous Corrosion***
Fatigue in the Presence of Corrosion; March 1999; 214p; In English, 7-9 Oct. 1998, Corfu, Greece; See also 19990026321 through 19990026338; Original contains color illustrations
Report No.(s): RTO-MP-18; AC/323(AVT)TP/8; ISBN 92-837-1011-8; Copyright Waived; Avail: CASI; A10, Hardcopy; A03, Microfiche

The NATO fleets are aging in both real time and in accrued fatigue damage. Corrosion and fatigue, independently, are high cost maintenance items and both can affect airworthiness. There is a synergistic relationship between these two phenomena. Cost effective and airworthy approaches to design and corrosion prevention must be defined. Work in NATO countries could be accelerated by a sharing of experience. During the Workshop 22 papers were grouped in four sessions: Session 1, In-service Experience with Corrosion Fatigue; Session 2, Simulation/Test Evaluation Programs; Session 3, Fatigue Prediction Methodologies in Corrosive Environments; and Session 4, Structural Integrity - Corrosion and Fatigue Interactions.
Author
Fatigue (Materials); Corrosion; Service Life; Aircraft Maintenance; Corrosion Prevention; Aircraft Structures; Structural Failure; Nondestructive Tests

19990027921 Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France
Alternative Control Technologies ***Technologies de Controle Non Conventionnelles***
Hudgins, Bernard, New Brunswick Univ., Canada; Leger, Alain, Sextant Avionique, France; Dauchy, Pierre, Institut de Medicine Aerospatiale Armee, France; Pastor, Dominique, Sextant Avionique, France; Pongratz, Hans, Flugmedizinisches Inst. der Luftwaffe, Germany; Rood, Graham, Defence Evaluation Research Agency, UK; South, Alan, Defence Evaluation Research Agency, UK; Carr, Karen, British Aerospace Public Ltd. Co., UK; Jarrett, Don, Defence Evaluation Research Agency, UK; McMillan, Grant, Armstrong Lab., USA; Anderson, Timothy, Armstrong Lab., USA; Borah, Joshua, Applied Science Labs., USA; December 1998; 148p; In English
Report No.(s): RTO-TR-7; AC/323(HFM)TP/3; ISBN 92-837-1009-6; Copyright Waived; Avail: CASI; A07, Hardcopy; A02, Microfiche

In January 1996, the Working Group 25 of the former AGARD Aerospace Medical Panel began to evaluate the potential of alternative (new and emerging) control technologies for future aerospace systems. The present report summarizes the findings of this group. Through different chapters, the various human factors issues related to the introduction of alternative control technologies into military cockpits are reviewed, in conjunction with more technical considerations of the state of the art of the enabling technologies. Cockpit integration issues are emphasized in regard to both human factors and engineering constraints.

Several specific applications of these new technologies in the aerospace environment are considered. Challenges for further developments are identified and recommendations issued. Globally, based upon operational considerations and currently recognized limitations of the Hands on Throttle and Stick (HOTAS) concept, the conclusion is that Alternative Control Technology should now be progressively introduced into the cockpit, as a function of degree of maturity of the various techniques.
Author
Aerospace Environments; Aerospace Systems; Cockpits; Human Factors Engineering; Aircraft Instruments; Adaptive Control; Automatic Flight Control; Artificial Intelligence; Fighter Aircraft; Tracking (Position); Pilots (Personnel); Human-Computer Interface

19990028611 Research and Technology Organization, Neuilly-sur-Seine, France
Land Operations in the Year 2020 (LO2020) ***Operations terrestres a l'horizon 2020 (LO2020)***
March 1999; 268p; In English
Report No.(s): RTO-TR-8; AC/323(SAS)TP/5; ISBN 92-837-1015-0; Copyright Waived; Avail: CASI; A12, Hardcopy; A03, Microfiche

This is the final report of the Long-Term Scientific Study on Land Forces in the Year 2020. This study identified the types of land forces and their capabilities and characteristics that will be required on the NATO battlefield in the year 2020 for warfighting and other military operations. This information provides SHAPE, and subsequently the major NATO Commanders, with a basis for long-term requirements and defence planning guidance.
Author
North Atlantic Treaty Organization (NATO); Military Operations; Warfare; Military Technology

19990032449 Research and Technology Organization, Systems Concepts and Integration Panel, Neuilly-sur-Seine France
System Identification for Integrated Aircraft Development and Flight Testing ***L'Identification des Systemes Pour le Developpement Integre des Aeronefs et des Essais en Vol***
System Identification for Integrated Aircraft Development and Flight Testing; March 1999; 412p; In English, 5-7 May 1998, Madrid, Spain; See also 19990032450 through 19990032478; Original contains color illustrations
Report No.(s): RTO-MP-11; AC/323(SCI)TP/7; ISBN 92-837-0006-6; Copyright Waived; Avail: CASI; A18, Hardcopy; A04, Microfiche

The NATO RTO symposium focused on the use of system identification as a "technology integrator". The symposium was organized in seven sessions covering an overview of recent aircraft programs, identification methodologies, flight test techniques, fixed-wing applications, rotary-wing applications, special vehicle applications (including UAVS) and a session comprising short papers covering "up-to-the-minute" flight test results. A final session presented prepared remarks from experts and concluded with an open discussion format to consider the key lessons learned in the application of system identification, and areas of needed future work.
Author
System Identification; Aircraft Design; Conferences; Flight Tests; Systems Engineering; Aerodynamics; Parameter Identification

19990032479 Advisory Group for Aerospace Research and Development, Human Performance Modelling Working Group, Neuilly-Sur-Seine, France
A Designer's Guide to Human Performance Modelling ***La Modelisation des Performances Humaines: Manuel du Concepteur***
A Designer's Guide to Human Performance Modelling; December 1998; 170p; In English; See also 19990032480 through 19990032490
Report No.(s): AGARD-AR-356; ISBN 92-836-1077-6; Copyright Waived; Avail: CASI; A08, Hardcopy; A02, Microfiche

Working Group 22 was convened in 1995, jointly sponsored by the Aerospace Medical Panel and the Flight Vehicle Panel to investigate the use of Human Performance Models within the specification, procurement, design, qualification and certification of military systems. In particular the group focused on the selection, application and use of HPMs by the system designer. An expert system approach was selected to ensure that the designer considered all the relevant factors when selecting a new model or tool. This was implemented using a commercially available expert system shell. The user is asked to select options that most closely describe his resources and requirements and the Human Operator Modelling Expert Review (HOMER) then rank-orders the HPMs in its database and suggests the most appropriate model. The group carried out some walkthroughs of existing models/tools to demonstrate typical uses in the analysis of specific issues. These are included as case studies. These were included to give potential users some insight into the ease or complexity of use in order to evaluate the required aspect of human performance. In

addition the group also considered the model developer community by examining the limitations of existing models, commercial implications and usability issues in order to guide any future development.
Author
Human Performance; Expert Systems; Models; Human Factors Engineering; Man Machine Systems; Systems Engineering; Operations Research

19990036191 Research and Technology Organization, Applied Vehicle and Technology Panel, Neuilly-sur-Seine, France
Fluid Dynamics Research on Supersonic Aircraft ***Les Travaux de Recherche en Dynamique des Fluides Relatifs aux Aeronefs Supersoniques***
November 1998; 332p; In English, 25-29 May 1998, Rhode-Saint-Genese, Belgium; See also 19990036192 through 19990036210
Report No.(s): RTO-EN-4; AC/323(AVT)TP/6; ISBN 92-837-1007-X; Copyright Waived; Avail: CASI; A15, Hardcopy; A03, Microfiche

The paper contains the lecture notes prepared for a Special Course on 'Fluid Dynamics Research on Supersonic Aircraft' organized by the RTO Applied Vehicle Technology Panel (AVT). The Course was held at the von Karman Institute for Fluid Dynamics (VKI) Institute, Rhode-Saint-Genese, Belgium 25-29 May 1998. The following topics were covered: History & Economics of Supersonic Transports, Supersonic Aerodynamics, Sonic Boom Theory and Minimization, Multi-Point Design Challenges, Vortex Plume Interactions, Propulsion System Design. Presentations on the major world wide supersonic transport programs were also included. The material assembled in this publication was prepared under the combined sponsorship of the RTO Applied Vehicle Technology Panel, the Consultant and Exchange Program of RTO, and the von Karman Institute (VKI) for Fluid Dynamics.
Author
Supersonic Transports; Fluid Dynamics; Supersonic Aircraft; Lectures; Aircraft Design; Aerodynamics

19990040714 Research and Technology Organization, Systems Concepts and Integration Panel, Neuilly-sur-Seine, France
Aircraft Weapon System Compatibility and Integration ***Compatibilite et Integration des Systemes d'Armes Aeroportes***
Aircraft Weapon System Compatibility and Integration; April 1999; 256p; In English; 3rd; Symposium of the Systems Concepts and Integration Panel, 28-30 September 1998, Chester, UK; Sponsored by Research and Technology Organization, France; See also 19990040715 through 19990040736; Original contains color illustrations
Report No.(s): RTO-MP-16; AC/323(SCI)TP/8; ISBN 92-837-0007-4; Copyright Waived; Avail: CASI; A12, Hardcopy; A03, Microfiche

Economic constraints dictate that the lives of existing aircraft must be stretched, making the incorporation of new weapons and weapon systems into existing airframes necessary. These same constraints dictate that the corollary is also true, i.e. that new aircraft must cope with existing weapons as well as their new systems. Along these lines, the goal of this symposium was to critically review the overall state-of-the-art in aircraft weapon system compatibility and integration for the benefit of researchers, RDT&E managers, engineers, and operational staff employed by both contractor and supplier organisations within NATO. Illuminating possible paths for future development and providing beneficial ideas and experience was achieved as part of the overall objective of the symposium. Also, the symposium explored both fixed and rotary wing applications as they related to the above mentioned session areas. Overall, the attendees were quite pleased with the presentations along with a very informative roundtable discussion.
Author
Conferences; Weapon Systems; Weapon System Management; Systems Integration; Fighter Aircraft; Systems Compatibility; Trajectory Analysis; External Stores; External Store Separation

19990046232 Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France
Aerospace 2020, Volume 2 ***Aeronautique et espace a l'horizon 2020, Volume II***
December 1998; 224p; In French
Report No.(s): AGARD-AR-360-Vol-2(F); ISBN 92-836-2002-X; Copyright Waived; Avail: CASI; A10, Hardcopy; A03, Microfiche

Volume II, is the main document of the "Aerospace 2020" report by the NATO Advisory Group for Aerospace Research and Development (AGARD). This study examines the most advanced aerospace technologies currently under development or study. It centers on what are now considered to be the most promising technologies, as well as structural and tactical consequences they will have on the theater of operations and on systems over the next 25 years. Subjects covered include the impact of proliferation, man-machine interaction, synthetic environments, directed-energy armaments, information technology, unpiloted tactical air-

craft, suborbital launchers, hypersonic missiles as well as a discussion of acceptable acquisition costs. The technologies are evaluated from two viewpoints: as assets and as threats. Remarks and recommendations are presented.
Transl. by Schreiber
Aerospace Engineering; North Atlantic Treaty Organization (NATO); Technology Assessment; Military Operations; Defense Program

19990046347 Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
Exploitation of Structural Loads/Health Data for Reduced Life Cycle Costs ***Exploitation des Donnees Relatives aux Efforts Structuraux et a l'Integrite des Structures en vue de la Diminution des Couts Globaux de Possession***
Exploitation of Structural Loads/Health Data for Reduced Life Cycle Costs; November 1998; 252p; In English, 11-12 May 1998, Brussels, Belgium; See also 19990046348 through 19990046366
Report No.(s): RTO-MP-7; AC/323(AVT)TP/4; ISBN 92-837-1005-3; Copyright Waived; Avail: CASI; A12, Hardcopy; A03, Microfiche

Contains the papers presented at a Specialists' Meeting on Exploitation of Structural Loads/Health Data for Reduced Life Cycle Costs, organized by the Applied Vehicle Technology Panel (AVT) of RTO, in Brussels, Belgium, 11-12 May 1998. The papers highlight the potential benefits from the exploitation of the information derived from modem and future monitoring systems in terms of improved airworthiness and preventative maintenance. The meeting concentrated on the collection, analysis and use of loads/health data by the military for fleet maintenance and logistics planning. Systems and techniques for data gathering and automated analysis were described by authors from a number of NATO nations to provide a valuable insight into how such systems contribute to reducing life cycle costs of military hardware. The papers are presented under the following headings: Current and future structural monitoring; Engine/helicopter hums; Current military/civil experience; Monitoring systems and analysis.
Author
Logistics; Loads (Forces); Life Cycle Costs; Health; Aircraft Reliability; Conferences; Maintenance