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Fuel Burn Modeling of Turboprop Aircraft Fuel Burn Modeling of Turboprop Aircraft **Structured Finite Volume Modeling of U.S. Navy Aircraft Engine Test Cells. Task 2: Turboprop Engine. Code Documentation and Listings Mathematical Model of Turboprop Engine Behaviour** Preliminary Model Specification, Lycoming Model LTC1F-3 Turboprop Engine, Specification No. 104.25 *A Methodology for Defining Aerodynamics and Propulsion Models for Turboprop Aircraft for Use in the Center TRACON Automation System (CTAS)* **Modeling and Vibration Control of Turboprop Installations [microform] Computerized Life and Reliability Modelling for Turboprop Transmissions Piloted Simulation Study of an ILS Approach of a Twin-pusher Business/commuter Turboprop Aircraft Configuration** *Organizational, Direct Support, and General Support Maintenance Manual* **Performance Simulation of Turboprop Engine for Basic Trainer Martin Model 262 Convoy Fighter GENENG** *The Model Turboprop Engine for Home Construction* **Intermediate Maintenance Manual Turboprop Aircraft Engine** Illustrated Parts Breakdown Turboprop Aircraft Engine **Advanced Turboprop Project** Whirl Flutter of Turboprop Aircraft Structures Model 217-5 and 217-6 Turboshaft and Turboprop 500 SHP Aircraft Engines *High Speed Turboprop Aeroacoustic Study (Single Rotation). Volume 1* **General Aviation Aircraft Design** *Civil Tiltrotor Feasibility Study for the New York and Washington Terminal Areas* Modelling, Stability Analysis, and Experimental Investigation of a Four-blade Turboprop Engine **Illustrated Parts Catalog Whirl Flutter of Turboprop Aircraft Structures** Maintenance Manual **The Allison Model 250 Engine** *Measured Far-Field Flight Noise of a Counterrotation Turboprop at Cruise Conditions Maintenance Manual* Hustler Model 500 Turboprop **Scientific and Technical Aerospace Reports** *Numerical Codes for Unsteady Simulation of Turbojet, Turbofan and Turboprop Engines for Training Purposes Monthly Catalog of United States Government Publications* Organizational, Direct Support, and General Support Maintenance Manual **Concentrated Mass Effects on the Flutter of a Composite Advanced Turboprop Model** Commercial Aviation *Ilustrated Parts Catalog Monthly Catalogue, United States Public Documents* Duty-free Entry Or Temporary Suspensions of Duty The Development Of The B-52 And Jet Propulsion: A Case Study In Organizational Innovation

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"This report documents work done to enhance turbo-propeller aircraft fuel consumption modeling in the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT). Fuel consumption and flight performance data were collected from aircraft flight manuals. These data were used to develop methods for predicting aircraft fuel consumption as a function of the aircraft flight state. The primary method

developed for this report showed a difference from the flight manual reported fuel consumption of about 12% in cruise mode."--Technical report documentation page. A frequency-domain noncompact-source theory for the steady loading and volume-displacement (thickness) noise of high speed propellers has been developed and programmed. Both near field and far field effects have been considered. The code utilizes blade surface pressure distributions obtained from three-dimensional nonlinear aerodynamic flow field analysis programs as input for evaluating the steady loading noise. Simplified mathematical models of the velocity fields induced at the propeller disk by nearby wing and fuselage surfaces and by angle-of-attack operation have been developed to provide estimates of the unsteady loading imposed on the propeller by these potential field type interactions. These unsteady blade loadings have been coupled to a chordwise compact propeller unsteady loading noise model to provide predictions of unsteady loading noise caused by these installation effects. Finally, an analysis to estimate the corrections to be applied to the free-field noise predictions in order to arrive at the measurable fuselage sound pressure levels has been formulated and programmed. This analysis considers the effects of fuselage surface reflection and diffraction together with surface boundary layer refraction. The steady loading and thickness model and the unsteady loading model have been verified using NASA-supplied data for the SR-2 and SR-3 model propfans. In addition, the steady loading and thickness model has been compared with data from the SR-6 model propfan. These theoretical models have been employed in the evaluation of the SR-7 powered Gulfstream aircraft in terms of noise characteristics at representative takeoff, cruise, and approach operating conditions. In all cases, agreement between theory and experiment is encouraging. Whitfield, C. E. and Gliebe, P. R. and Mani, R. and Mungur, P. Unspecified Center AERODYNAMIC LOADS; AERODYNAMIC NOISE; AIRCRAFT NOISE; FLOW DISTRIBUTION; INTERACTIONAL AERODYNAMICS; MATHEMATICAL MODELS; NOISE PREDICTION (AIRC... Whirl Flutter of Turboprop Aircraft Structures, Second Edition explores the whirl flutter phenomenon, including theoretical, practical, analytical and experimental aspects of the matter. Sections provide a general overview regarding aeroelasticity, discussions on the physical principle and the occurrence of whirl flutter in aerospace practice, and experimental research conducted, especially from the 60s. Other chapters delve into analytical methods such as basic and advanced linear models, non-linear and CFD based methods, certification issues including regulation requirements, a description of possible certification approaches, and several examples of aircraft certification from aerospace. Finally, a database of relevant books, reports and papers is provided. This updated and expanded second edition covers new chapters including both analytical and experimental aspects of the subject matter. Provides complex information on turboprop aircraft whirl flutter phenomenon Presents both theoretical and practical (certification related) issues Includes experimental research as well as analytical models (basic and advanced) of matter Includes both early-performed works and recent developments Contains a listing of relevant books and reports A generalized life and reliability model is presented for parallel shaft geared prop-fan and turboprop aircraft transmissions. The transmission life and reliability model is a combination of the individual reliability model for all the bearings and gears in the main load paths. The bearing and gear reliability models are based on classical fatigue theory and the two parameter Weibull failure distribution. A computer program was developed to calculate the transmission life and reliability. The program is modular. In its present form, the program can analyze five different transmission arrangements. However, the program can be modified easily to include additional transmission arrangements. An example is included which compares the life of a split-torque, parallel compound two-stage transmission, as calculated by the computer program. (jes). NASA tasked LMI to assess the potential contributions of a yet-undeveloped Civil Tiltrotor aircraft (CTR) in improving capacity in the National Airspace System in all weather conditions. The CTRs studied have assumed operating parameters beyond current CTR capabilities. LMI analyzed CTRs three ways: in fast-time terminal area modeling simulations of New York and Washington to determine delay and throughput impacts; in the Integrated Noise Model, to determine local environmental impact; and with an economic model, to determine the price viability of a CTR. The fast-time models encompassed a 250 nmi range and included traffic interactions from local airports. Both the fast-time simulation and the noise model assessed impacts from traffic levels projected for 1999, 2007, and 2017. Results: CTRs can reduce terminal area delays due to concrete congestion in all time frames. The maximum effect, the ratio of CTRs to jets and turboprop aircraft at a subject airport should be optimized. The economic model considered US traffic only and forecasted CTR sales beginning in 2010.Stouffer, Virginia and Johnson, Jesse and Gribko, Joana and Yackovetsky, Robert (Technical Monitor)Langley Research CenterFEASIBILITY ANALYSIS; ECONOMICS; ENVIRONMENTAL SURVEYS; MODELS; TILT ROTOR AIRCRAFT; TURBOPROP AIRCRAFT; NATIONAL AIRSPACE SYSTEM; AIRPORTS; CONCRETES; CONGESTION; SIMULATION; TRAFFIC; VIABILITY; WEATHER Provides a practical approach to producing a small but powerful turbo-prop engine. The history of the development, design theory, and operational procedures are all clearly explained. This report presents results of the numerical simulation of a U.S. Naval turboprop test cell facility. The ultimate purpose of this simulation was to provide the Navy with a numerical model to be used for the evaluation of the aerothermal performance of test cells. This simulation was performed using the structured finite volume (SFV) computer code. A description of the physical model, mathematical details, boundary conditions, and results of the study are presented and covered in Volume 1. Volume 2, Code Documentation and Listings, provides a copy of the input files developed for the modeling of turboprop test cells ... Computational fluid dynamics, Test cells, Aviation test facilities. This report is the final deliverable of an internship which is part of the fifth year curriculum of the faculty of Aerospace Engineering at the Delft University of Technology. The two authors had the privilege of conducting their internship at the John A. Volpe National Transportation Systems Center. There they worked in the Environmental Measurement and Modeling Division. The main assignment consisted of finding a method to model the fuel burn of turboprop aircraft flying over America's national parks. To do this the authors first had to get familiarized with the Aviation Environmental Design Tool (AEDT), which is a model capable of calculating the noise and fuel burn emissions of aircraft. The Martin Model 262 was an unconventional turboprop VTOL aircraft proposal submitted to the US Navy’s convoy fighter competition of 1950, which ultimately produced the Convair XFY-1 Pogo and Lockheed XFV-1 Salmon. It was a swept-wing aircraft with triple vertical tails powered by an Allison XT-40-A-8 turboprop engine driving 16 ft contra-rotating propellers. The launch and recovery system consisted of a hinged vertical platform mounted on a merchant ship. The pilot approached the platform from the side and hovered vertically just in front of it, attaching the aircraft to the platform with a retractable nosegear spike and landing on two small retractable wing gear. The fighter was armed with four 20 mm cannon and was designed to protect convoy vessels from enemy air attack. In addition to the basic Model 262, Martin also presented Modifications A, B and C, the configurations of which were even more unorthodox than the main proposal. Finally, the book examines the Model 262P, a handsome scale demonstrator designed to verify the basic soundness of the concept. This ebook features a comprehensive text and 56 high resolution illustrations, including detailed schematics, artist’s impressions, and speculative color profiles of these remarkable secret aircraft projects. This is the author’s second book covering the USN convoy fighter competition, the first one being devoted to the Goodyear GA-28A/B, also available in the Google Play store and other bookstores worldwide. Whirl flutter is the aeroelastic phenomenon caused by the coupling of aircraft propeller aerodynamic forces and the gyroscopic forces of the rotating masses (propeller, gas turbine engine rotor). It may occur on the turboprop, tilt-prop-rotor or rotorcraft aircraft structures. Whirl Flutter of Turboprop Aircraft Structures explores the whirl flutter phenomenon, including theoretical and practical as well as analytical and experimental aspects of the matter. The first introductory part gives a general overview regarding aeroelasticity, followed by the physical principle and the occurrence of whirl flutter in aerospace practice. The next section deals with experiment research including earlier activities performed, particularly from the sixties, as well as recent developments. Subsequent chapters discuss analytical methods such as basic and advanced linear models, and non-linear and CFD based methods. Remaining chapters summarize certification issues including regulation requirements, a description of possible certification approaches and several examples of aircraft certification from the aerospace practice. Finally, a database of relevant books and reports is provided.

provides complex information of turboprop aircraft whirl flutter phenomenon presents both theoretical and practical (certification related) issues presents experimental research as well as analytical models (basic and advanced) of matter includes both early-performed works and recent developments contains a listing of relevant books and reports General Aviation Aircraft Design, Second Edition, continues to be the engineer’s best source for answers to realistic aircraft design questions. The book has been expanded to provide design guidance for additional classes of aircraft, including seaplanes, biplanes, UAS, high-speed business jets, and electric airplanes. In addition to conventional powerplants, design guidance for battery systems, electric motors, and complete electric powertrains is offered. The second edition contains new chapters: Thrust Modeling for Gas Turbines Longitudinal Stability and Control Lateral and Directional Stability and Control These new chapters offer multiple practical methods to simplify the estimation of stability derivatives and introduce hinge moments and basic control system design. Furthermore, all chapters have been reorganized and feature updated material with additional analysis methods. This edition also provides an introduction to design optimization using a wing optimization as an example for the beginner. Written by an engineer with more than 25 years of design experience, professional engineers, aircraft designers, aerodynamicists, structural analysts, performance analysts, researchers, and aerospace engineering students will value the book as the classic go-to for aircraft design. The printed book is now in color, with 1011 figures and illustrations! Presents the most common methods for conceptual aircraft design Clear presentation splits text into shaded regions, separating engineering topics from mathematical derivations and examples Design topics range from the "new" 14 CFR Part 23 to analysis of ducted fans. All chapters feature updated material with additional analysis methods. Many chapters have been reorganized for further help. Introduction to design optimization is provided using a wing optimization as an example for the beginner Three new chapters are offered, two of which focus on stability and control. These offer multiple practical methods to simplify the estimation of stability derivatives. The chapters introduce hinge moments and basic control system design Real-world examples using aircraft such as the Cirrus SR-22 and Learjet 45 National security decision makers face an uncertain world where the accelerated growth of knowledge has changed the character of technological advance and destabilized long-standing relations within and among the military services. Dr Mandeles separates the principles that guide decision making from the proverbs through a case study of decision making in the early post-World War II period. This study examines the impact of organization on the invention and development of jet propulsion-in the form of the B-52-and illustrates both the organizational conditions conducive to developing new operational concepts and the organizational innovations necessary to implement new technology. This study also examines how the Air Force organized to learn and acquire new technology, how the Air Force conceived or identified problems, and how it organized to ensure management would respond to program failure or errors. Attention is devoted to the origins of the weapons system operational requirement, the initial concept of operation, the evolution of technology, organizational structure, and implementation. Modern high speed propeller (advanced turboprop) aircraft are expected to operate on 50 to 60 percent less fuel than the 1980 vintage turbofan fleet while at the same time matching the flight speed and performance of those aircraft. Counterrotation turboprop engines offer additional fuel savings by means of upstream propeller swirl recovery. This paper presents acoustic sideline results for a full-scale counterrotation turboprop engine at cruise conditions. The engine was installed on a Boeing 727 aircraft in place of the right-side turbofan engine. Acoustic data were taken from an instrumented Learjet chase plane. Sideline acoustic results are presented for 0.50 and 0.72 Mach cruise conditions. A scale model of the engine propeller was tested in a wind tunnel at 0.72 Mach cruise conditions. The model data were adjusted to flight acquisition conditions and were in general agreement with the flight results. Woodward, Richard P. and Loeffler, Irvin J. and Dittmar, James H. Glenn Research Center NASA-TM-101383, E-4437, NAS 1.15:101383 RTOP 535-03-01... A six-degree-of-freedom nonlinear simulation of a twin-pusher, turboprop business/commuter aircraft configuration representative of the Cessna ATPTB (Advanced turboprop test bed) was developed for use in piloted studies with the Langley General Aviation Simulator. The math models developed are provided, simulation predictions are compared with with Cessna flight-test data for validation purposes, and results of a handling quality study during simulated ILS (instrument landing system) approaches and missed approaches are presented. Simulated flight trajectories, task performance measures, and pilot evaluations are presented for the ILS approach and missed-approach tasks conducted with the vehicle in the presence of moderate turbulence, varying horizontal winds and engine-out conditions. Six test subjects consisting of two research pilots, a Cessna test pilot, and three general aviation pilots participated in the study. This effort was undertaken in cooperation with the Cessna Aircraft Company.

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