Turbofan And Turbojet Engines Database Handbook

ROSA BURNS

Breakthrough: The Geared Turbofan from Pratt & Whitney Elodie Roux
History and classifications of aero-engine -- Performance parameters of jet engines -- Pulsejet and ramjet engines -- Turbojet engine -- Turbofan engines -- Shaft engines -- High speed supersonic and hypersonic engines -- Industrial gas turbines -- Power plant installation and intakes -- Combustion systems -- Exhaust system -- Centrifugal compressors -- Axial flow compressors and fans -- Axial turbines -- Radial inflow turbines -- Module matching -- Selected topics -- Introduction to rocketry -- Rocket engines

Supersonic Business Jets in Preliminary Aircraft Design Elsevier
History and Evolution of Aircraft reviews the history of aviation from early history to the present day, including the evolution milestones of military aircraft, civil aircraft, helicopters, drones, balloons, airships, and their engines. It also provides the background and development of different types of aircraft, including manned and unmanned vehicles, aircraft carriers, fixed or rotary wings, air, sea, and amphibian flight vehicles. Covering current and developing applications of unmanned aerial vehicles (UAVs), the book highlights the prospects of future flying vehicles including automotives and jetpacks. It follows the transition from piston to jet engines that include shaft-based engines (turboprop, turboshaft, and propfan), turbine-based engines (turbojet and turbofan), and athodyd engines (ramjet, turbo-ramjet, and scramjet). The book explores flight vehicles' technological advancements and evolution, including their geometrical features and performance parameters. It will also include nine appendices resembling databases for all types of aircraft. The book will be a useful reference for academic researchers and aviation, aerospace, and mechanical engineering students taking aerodynamics, aircraft structures, aircraft engines, and propulsion courses. Aviation history enthusiasts will be interested in the scope of the content as well. Instructors can utilize a Solutions Manual for their course.

BASIC TECHNICAL DATA OF THE ENGINE. BiblioGov
This paper describes a recommended practice and procedure for

the correlation of test cells that are used for the performance testing of turbofan and turbojet engines. Test cell correlation is performed to determine the effect of any given test cell enclosure and equipment on the performance of an engine relative to the baseline performance of that engine. When baseline testing is performed in an indoor test cell, the baseline performance data are adjusted to open air conditions. Although no original equipment manufacturer (OEM) documents are actually referenced, the experience and knowledge of several OEMs contributed to the development of this document. Each engine Manufacturer has their own practices relating to correlation and they will be used by those OEMS for the purpose of establishing certified test facilities. Update the references to be aligned with the other correlation papers from this committee and to meet SAE Standards.

Analysis of Turbofan Propulsion System Weight and Dimensions AirInsight

The full development history of Westinghouse's four earliest engine models is documented in this volume, the data taken from the original source documents wherever possible. 361 Pages / 191 Illustrations. Early turbojet engine development by Westinghouse began in 1940 as experimental analysis first for the National Advisory Committee for Aeronautics and continued for the U.S. Navy's Bureau of Aeronautics after December 7, 1941. The early impressive successes of the engine models covered in this volume triggered Navy support for later, higher thrust engines. Westinghouse would become a major supplier of turbojet engines for the Navy until the early 1950's. The engine Model 19A deserves to be honored as the first successfully run axial turbojet in the United States, developed in almost total isolation from the jet engine development work being pursued by other firms and nations. The performance of this engine allowed the U.S. Navy to pursue rapid development along several lines and soon the 19B was developed into the 19XB-2B (J30), used in the early McDonnell FD-1 Phantom carrier based fighter. The 9.5A/B (J32) was begun as a scaled down version of the 19A for use in light weight fighter planes and then was shifted for use in several limited target drone applications. The ability of Westinghouse to successfully use the base aerodynamic layout of the 19B in the two other engines was to be demonstrated yet again in their later designs.

The Influence of Bypass Turbojet Engine Parameters on the Technical-Economic Characteristics of Long-Range Passenger Aircraft Springer Nature

The report describes parametric study of turbofan engines, intended for subsonic passenger main-liner aircraft with long flight range (up to 15,000 km) and increased passenger accommodation (up to 500 passengers). As a result of the study it is revealed the optimum values of parameters of operating conditions and the bypass ratio of turbofan engines, providing minimum values of takeoff weight of the aircraft and the smallest operating costs. In the study are also given data on the evaluation of the noise level of contemporary turbofan engines.

Turbofan and Turbojet Gas Turbine Engine Test Cell Correlation CRC Press

This study presents results of a theoretical evaluation of the performance of an afterburning turbofan engine when used for high altitude, high speed flight. The calculated performance is compared with that of a conventional turbojet, and also a combination ramturbojet, by means of the performance parameters of specific fuel consumption and specific thrust. As the study involved a considerable amount of calculations, the problem was coded in Fortran computer language by the writer. The results of the study were generated by the Control Data Corporation model 1604 digital computer of the Postgraduate School. The results of the study indicate that above Mach 2 the afterburning turbofan shows an increasing performance advantage with increasing Mach number and altitude over the turbojet engine. (Author).

DYNGEN Springer Nature

This report presents a compilation of static sea-level data on existing or designed American and British axial-flow turbojet engines in terms of basic engine parameters such as thrust and air flow. In the data presented, changes in the over-U engine performance with time sre examined as well as the relation of the various engine parameters to each other.

Interactive Educational Tool for Turbofan and After-burning Turbojet Engines Springer Science & Business Media

This study presents results of a theoretical evaluation of the performance of an afterburning turbofan engine when used for high altitude, high speed flight. The calculated performance is compared with that of a conventional turbojet, and also a combination ramturbojet, by means of the performance parameters of specific fuel consumption and specific thrust. As the study involved a considerable amount of calculations, the problem was coded in Fortran computer language by the writer. The results of the study were generated by the Control Data Corporation model 1604 digital computer of the Postgraduate School. The results of the study indicate that above Mach 2 the afterburning turbofan shows an increasing performance advantage with increasing Mach number and altitude over the turbojet engine. (Author).

The Development of Jet and Turbine Aero Engines MIT Press

Traces the history and development of the jet engine

GENENG Springer Science & Business Media

A computer program titled GENENG II which calculates steady-state design and off-design jet engine performance for two- or three-spool turbofans with one, two, or three nozzles is described. Included in the report are complete FORTRAN IV listings of the program with sample results for nine basic turbofan engines that can be calculated: (1) three-spool, three-stream engine; (2) two-spool, three-stream, boosted-fan engine; (3) two-spool, three-stream, supercharged-compressor engine; (4) three-spool, two-stream engine; (5) two-spool, two stream engine; (6) three-spool, three-stream, aft-fan engine; (7) two-spool, three-stream, aft-fan engine; (8) two-spool, two-stream, aft-fan engine; (9) three-spool, two-stream, aftfan engine. The simulation of other engines by using logical variables built into the program is also described. The computer program is available from the authors.

Graphic Analysis of American and British Axial-Flow Turbojet Engine Performance Trends, Current and Future Elodie Roux

A significant addition to the literature on gas turbine technology, the second edition of Gas Turbine Performance is a lengthy text covering product advances and technological developments. Including extensive figures, charts, tables and formulae, this book will interest everyone concerned with gas turbine technology, whether they are designers, marketing staff or users.

Investigation of Acceleration Characteristics of a Single-spool Turbojet Engine John Wiley & Sons

The document contains a list of data pertaining to the turbojet engine RD-3M-500. There is also a table giving operating conditions for the engine.

History and Evolution of Aircraft Independently Published

Professors Wild and Davis, both of Purdue University, have updated the classic Aircraft Turbine Engines textbook to create the second edition. This new edition contains the latest in turbine engine technology and manufacturing practices. Of course, it still covers the unchanging principles of heat engines, performance factors, and all the terminology that goes with them.This book

was written for powerplant technicians and crewmembers who service, maintain, and operate gas turbine engines used on today's aircraft. Comprehensive diagrams and images are used throughout the text to illustrate key concepts. Turbine engine practices and techniques provide background information on standard industry practices.Turbofan, turboprop, and turboshaft engines are explored, emphasizing their differences and how they fulfill unique requirements. Example engine models are explored in detail for each type. Readers can easily understand engine systems and components and their function as part of the overall engine operation.Topics?History and advancement of turbine engines?Turbine principles?Terms and engine types?Turbine design?Turbine engine systems and maintenance?Testing and operation?Turbofan engines?Turboprop engines?Turboshaft engines and APUs?Inspection and maintenance?Fault analysis?Turbine engine manufacturing

Second Generation Gas-turbine Engines: Discussion of Turbofan Engines Springer Nature

This nine-volume set LNCS 14104 – 14112 constitutes the refereed workshop proceedings of the 23rd International Conference on Computational Science and Its Applications, ICCSA 2023, held at Athens, Greece, during July 3–6, 2023. The 350 full papers and 29 short papers and 2 PHD showcase papers included in this volume were carefully reviewed and selected from a total of 876 submissions. These nine-volumes includes the proceedings of the following workshops: Advances in Artificial Intelligence Learning Technologies: Blended Learning, STEM, Computational Thinking and Coding (AAILT 2023); Advanced Processes of Mathematics and Computing Models in Complex Computational Systems (ACMC 2023); Artificial Intelligence supported Medical data examination (AIM 2023); Advanced and Innovative web Apps (AIWA 2023); Assessing Urban Sustainability (ASUS 2023); Advanced Data Science Techniques with applications in Industry and Environmental Sustainability (ATELIERS 2023); Advances in Web Based Learning (AWBL 2023); Blockchain and Distributed Ledgers: Technologies and Applications (BDLTA 2023); Bio and Neuro inspired Computing and Applications (BIONCA 2023); Choices and Actions for Human Scale Cities: Decision Support Systems (CAHSC-DSS 2023); and Computational and Applied Mathematics (CAM 2023).

Jet Web CRC Press

The article describes a way of making turbofan engines by the use of well-designed turbojet engines and discusses the efficiency of such a conversion. The use of an afterburner in a turbofan engine, permitting the use of these engines at high supersonic flight speeds, is also discussed. The author cites specific English and American aircraft now using turbofan engines. A diagram of the X353-5 turbofan engine with a high by-pass ratio is shown; this engine is intended for the XV-5A VERTOL airplane. Turbofan engines with afterburners are being mounted in test aircraft. The author discusses performance of such engines. Future tactical aircraft and the type of engine required for their missions are described. Replacing of kerosene with liquid hydrogen is considered. The importance of reducing the weight of engines in order to increase the capability of airplanes is stressed. (Author).

Good Practices and New Perspectives in Information Systems and Technologies Motorbooks International

The Preliminary Aircraft Design and Optimisation tool, PrADO, is an in-house program of the Institute of Aircraft Design and Lightweight Structures, TU Braunschweig, Germany, which covers a wide range of aspects of aircraft preliminary design. An initial aircraft concept serves as a basis for various analysis modules. Each module is designated to fulfil one special task e.g. aerodynamic analysis, estimation of structural mass, etc. The available methods grouped within those modules range from statistical methods to physics based models. From an aircraft developer's point of view PrADO is used within both, the conceptual and the preliminary design phase. The aim of this thesis is to introduce methods and methodologies to aircraft conceptual and preliminary design, more precisely to PrADO, that allow to judge supersonic aircraft concepts. Therefore, the aerodynamic analysis module, the structural analysis module and the propulsion module are extended. An inviscid flow solver is integrated to obtain aerodynamic coefficients. The calculated data serves as input to other analysis modules of PrADO. While the aerodynamic analysis module solely uses the outer geometry of the aircraft, the structural analysis module uses its internal structural layout as additional input to a herein developed finite element model generator. The distribution of secondary mass, fuel loading and payload distributions as well as loads for ground cases and trimmed flight cases are taken from the PrADO database, whereas the aerodynamic forces are calculated by solving the inviscid Euler equations. The model serves as basis for structural sizing and consequently the estimation of structural mass. The purpose of the propulsion module is to size the engine, to calculate the engine performance map and to provide reliable mass data based on the thermodynamic cycle. PrADO provides various models for the analysis of turbojet, turbofan and turboprop engines. It is extended by a turbofan engine with mixed

Comparison of Parametric Duct-burning Turbofan and Non-afterburning Turbojet Engines in a Mach 2.7 Transport

Pratt & Whitney was at one time the dominant player in commercial aircraft engines, only to lose market leadership to GE and CFM International over the past two decades. After an extended 20 year period of research and development on a new architecture that proved fruitful, P&W is poised for a market share rebound through the introduction of innovative, game changing technology.

The Engine Handbook

Compressor performance and turbine performance are presented in the form of performance maps at selected values of Reynolds number index; the effects of Reynolds number on performance are summarized. The effects of variable stator angle and high inlet-air temperatures on compressor performance are also shown. Over-all engine performance (net thrust and specific fuel consumption) is presented for a flight Mach number of 0.9 at rated engine conditions over a range of altitudes to illustrate performance losses resulting from decreased Reynolds number index.

Early Westinghouse Axial Turbojets

A computer program titled GENENG is described. The program uses component performance maps to enable the user to do analytical steady-state engine cycle calculations. Through a scaling procedure, each of the component maps can be used to represent a family of maps (different design values of pressure ratios, efficiency, weight flow, etc.). Either convergent or convergent divergent nozzles may be used. Included is a complete FORTRAN IV listing of the program. Sample results and input explanations are shown for one-spool and two-spool turbojets and two-spool separate and mixed-flow turbofans operating at design and off-design conditions. The computer program is available from the authors.

Comparison of Parametric Duct-burning Turbofan and Non-afterburning Turbojet Engines in a Mach 2.7 Transport

Aircraft Engines and Gas Turbines is widely used as a text in the United States and abroad, and has also become a standard reference for professionals in the aircraft engine industry. Unique in treating the engine as a complete system at increasing levels of sophistication, it covers all types of modern aircraft engines,

including turbojets, turbofans, and turboprops, and also discusses hypersonic propulsion systems of the future. Performance is described in terms of the fluid dynamic and thermodynamic limits on the behavior of the principal components: inlets, compressors, combustors, turbines, and nozzles. Environmental factors such as atmospheric pollution and noise are treated along with performance. This new edition has been substantially revised to include more complete and up-to-date coverage of compressors, turbines, and combustion systems, and to introduce current research directions. The discussion of high-bypass turbofans has been expanded in keeping with their great commercial importance. Propulsion for civil supersonic transports is taken up in the current context. The chapter on hypersonic air breathing engines has been expanded to reflect interest in the use of scramjets to power the National Aerospace Plane. The discussion of exhaust emissions and noise and associated regulatory structures have been updated and there are many corrections and clarifications.