Portable Static Test Facility for Small, Expendable, Turbojet Engines. Phase 1

Aviation Noise

NASA Scientific and Technical Reports

Design, Fabrication and Testing of Small Scale Turbine Jet Engine

Scientific and Technical Aerospace Reports

Turbocharges to Small Turbojet Engines for Uninhabited Aerial Vehicles

Gas Turbine Engines for Model Aircraft

Airplane Flying Handbook (FAA-H-8083-3A)

ASME Technical Papers
exhaust nozzle. Turbine jet engine operates at an open cycle called a jet propulsion cycle. A small-scale turbine jet engine comprises of the same element as the gas-turbine engine but in a smaller scale. Both engines differ in utilization and purpose of its production. Turbine jet engines were constructed mainly for air transportation while the small-scale turbine jet engines are developed for a wider purpose, ranging for research activity to hobbyist enthusiastic. Hence, this thesis encompasses the design, fabrication, and testing a small-scale turbine jet engine. The engine was derived from an automobile turbocharger, which provided the turbine and compressor component. A combustion chamber was design and fabricated. Engine support system comprised of ignition, lubrication and fuel delivery system were installed at the engine. The engine assembly was mounted in a test setup. Thermocouples were installed at three different stations on the engine flow path to measure the temperature. Fuel regulators were utilized to measure the fuel flow. The engine was started using a specific procedure until it self-sustained. During testing, the engine was only able to self-sustain approximated for 10 seconds at kg/s fuel mass flow rate. Troubleshooting and analysis regarding the failure of the engine was done. Analysis shows that there are four possible factors involves, namely, the uses of LPG fuel, large pressure drop at the exit of combustion chamber, low pressure pump and leaking at the turbocharger. Four recommendations were made for further studies, which are, utilize a brand-new turbocharger for the engine, use a pure propane gas as a source of fuel, avoid uses of pipe flange at the combustion chamber and utilize a higher pressure pump for lubrication system. Further modification was not made due to time and cost limitation.

Inventory of energy research and development--1973-1975

Program Solicitation

This volume covers the state-of-the art of the research and development in various aspects of computational intelligence and gives some perspective directions of development. Except the traditional engineering areas that contain theoretical knowledge, applications, designs and projects, the book includes the area of use of computational intelligence in biomedical engineering. "Aspects of Computational Intelligence: Theory and Applications" is a compilation of carefully selected extended papers written on the basis of original contributions presented at the 15th IEEE International Conference on Intelligence Engineering Systems 2011, INES 2011 held at June 23.-26. 2011 in AquaCity Poprad, Slovakia.

Aspects of Computational Intelligence: Theory and Applications

Progress in Exergy, Energy, and the Environment

Factors that Affect Operational Reliability of Turbojet Engines

This book presents a wide-ranging review of the latest research and development directions in thermal systems optimization using population-based metaheuristic methods. It helps readers to identify the best methods for their own systems, providing details of mathematical models and algorithms suitable for implementation. To reduce mathematical complexity, the authors focus on optimization of individual components rather than taking on systems as a whole. They employ numerous case studies: heat exchangers; cooling towers; power generators; refrigeration systems; and others. The importance of these subsystems to real-world situations from internal combustion to air-conditioning is made clear. The thermal systems under discussion are analysed using various metaheuristic techniques, with comparative results for different systems. The inclusion of detailed MATLAB® codes in the text will assist readers—researchers, practitioners or students—to assess these techniques for different real-world systems. Thermal System Optimization is a useful tool for thermal design researchers and engineers in academia and industry, wishing to perform thermal system identification with properly optimized parameters. It will be of interest for researchers, practitioners and graduate students with backgrounds in mechanical, chemical and power engineering.

Jet Propulsion

The primary human activities that release carbon dioxide (CO2) into the atmosphere are the combustion of fossil fuels (coal, natural gas, and oil) to generate electricity, the provision of energy for transportation, and as a consequence of some industrial processes. Although aviation CO2 emissions only make up approximately 2.0 to 2.5 percent of total global annual CO2 emissions, research to reduce CO2 emissions is urgent because (1) such reductions may be legislated even as commercial air travel grows, (2) because it takes new technology a long time to propagate into and through the aviation fleet, and (3) because of the ongoing impact of global CO2 emissions. Commercial Aircraft Propulsion and Energy Systems Research develops a national research agenda for reducing CO2 emissions from commercial aviation. This report focuses on propulsion and energy technologies for reducing carbon emissions from large, commercial aircraft and twin-aisle aircraft that carry 100 or more passengers because such aircraft account for more than 90 percent of global emissions from commercial aircraft. Moreover, while smaller aircraft also emit CO2, they make only a minor contribution to global emissions, and many technologies that reduce CO2 emissions for large aircraft also apply to smaller aircraft. As commercial aviation continues to grow in terms of revenue-passenger miles and cargo ton miles, CO2 emissions are expected to increase. To reduce the contribution of aviation to climate change, it is essential to improve the effectiveness of ongoing efforts to reduce emissions and initiate research into new approaches.

The History of North American Small Gas Turbine Aircraft Engines

Design of Radial Turbomachines

Three test programs were conducted to provide the preliminary groundwork for the design of a small turbojet engine from
Three test programs were conducted to provide the preliminary groundwork for the design of a small turbojet engine from turbocharger rotor components for possible Uninhabited Aerial Vehicle applications. The first program involved the performance mapping of the Garrett T2 turbocharger centrifugal compressor. The second program involved the bench testing of a small turbojet engine, the Sophia J450, at 115000 RPM, and comparing the results to another small turbojet, the JPX-240, from previously documented research. The compressor radii of the two engines were identical but greater than that of the Garrett compressor. The two engines, despite their physical similarities, had different fuel requirements. The J450 used heavy fuel (fuel pump required) while the JPX used liquid propane (pressurized fuel tank required). The third program involved the performance prediction of the J450 using GASTURB cycle analysis software. The compressor map generated from the Garrett T2 test was imported into GASTURB and used to predict the J450 performance at 94000, 105000, 115000, and 123000 RPM. The performance predictions agreed reasonably well with actual J450 performance.

**Small Turbofan Engine for UAV**

**NACA Research Memorandum**

**Thermal System Optimization**

**New Trends in Technologies**

**Turbochargers to Small Turbojet Engines for Uninhabited Aerial Vehicles**

Annotation A design textbook attempting to bridge the gap between traditional academic textbooks, which emphasize individual concepts and principles; and design handbooks, which provide collections of known solutions. The airbreathing gas turbine engine is the example used to teach principles and methods. The first edition appeared in 1987. The disk contains supplemental material. Annotation c. Book News, Inc., Portland, OR (booknews.com).

**Technical Data Digest**

**NASA technical note**

Three test programs were conducted to provide the preliminary groundwork for the design of a small turbojet engine from turbocharger rotor components for possible Uninhabited Aerial Vehicle applications. The first program involved the performance mapping of the Garrett T2 turbocharger centrifugal compressor. The second program involved the bench testing of a small turbojet engine, the Sophia J450, at 115000 RPM, and comparing the results to another small turbojet, the JPX-240, from previously documented research. The compressor radii of the two engines were identical but greater than that of the Garrett compressor. The two engines, despite their physical similarities, had different fuel requirements. The J450 used heavy fuel (fuel pump required) while the JPX used liquid propane (pressurized fuel tank required). The third program involved the performance prediction of the J450 using GASTURB cycle analysis software. The compressor map generated from the Garrett T2 test was imported into GASTURB and used to predict the J450 performance at 94000, 105000, 115000, and 123000 RPM. The performance predictions agreed reasonably well with actual J450 performance.

**Principles of Turbomachinery in Air-Breathing Engines**

**Airplane Power Plants**

Find the right answer the first time with this useful handbook of preliminary aircraft design. Written by an engineer with close to 20 years of design experience, General Aviation Aircraft Design: Applied Methods and Procedures provides the practicing engineer with a versatile handbook that serves as the first source for finding answers to realistic aircraft design questions. The book is structured in an “equation/derivation/solved example” format for easy access to content. Readers will find it a valuable guide to topics such as sizing of horizontal and vertical tails to minimize drag, sizing of lifting surfaces to ensure proper dynamic stability, numerical performance methods, and common faults and fixes in aircraft design. In most cases, numerical examples involve actual aircraft specs. Concepts are visually depicted by a number of useful black-and-white figures, photos, and graphs (with full-color images included in the eBook only). Broad and deep in coverage, it is intended for practicing engineers, aerospace engineering students, mathematically astute amateur aircraft designers, and anyone interested in aircraft design. Organized by articles and structured in an "equation/derivation/solved example" format for easy access to the content you need Numerical examples involve actual aircraft specs Contains high-interest topics not found in other texts, including sizing of horizontal and vertical tails to minimize drag, sizing of lifting surfaces to ensure proper dynamic stability, numerical performance methods, and common faults and fixes in aircraft design Provides a unique safety-oriented design checklist based on industry experience Discusses advantages and disadvantages of using computational tools during the design process Features detailed summaries of design options detailing the pros and cons of each aerodynamic solution Includes three case studies showing applications to business jets, general aviation aircraft, and UAVs Numerous high-quality graphics clearly illustrate the book's concepts (note: images are full-color in eBook only)

**Federal Register**

This landmark joint publication between the National Air and Space Museum and the American Institute of Aeronautics and Astronautics chronicles the evolution of the small gas turbine engine through its comprehensive study of a major
aerospace industry. Drawing on in-depth interviews with pioneers, current project engineers, and company managers, engineering papers published by the manufacturers, and the tremendous document and artifact collections at the National Air and Space Museum, the book captures and memorializes small engine development from its earliest stage. Leyes and Fleming leap back nearly 50 years for a first look at small gas turbine engine development and the seven major corporations that dared to produce, market, and distribute the products that contributed to major improvements and uses of a wide spectrum of aircraft. In non-technical language, the book illustrates the broad-reaching influence of small turbines from commercial and executive aircraft to helicopters and missiles deployed in recent military engagements. Detailed corporate histories and photographs paint a clear historical picture of turbine development up to the present. See for yourself why The History of North American Small Gas Turbine Aircraft Engines is the most definitive reference book in its field. The publication of The History of North American Small Gas Turbine Aircraft Engines represents an important milestone for the National Air and Space Museum (NASM) and the American Institute of Aeronautics and Astronautics (AIAA). For the first time, there is an authoritative study of small gas turbine engines, arguably one of the most significant spheres of aeronautical technology in the second half of

**General Aviation Aircraft Design**

The International Symposium of Hungarian Researchers on Computational Intelligence and Informatics celebrated its 10 edition in 2009. This volume contains a careful selection of papers that are based on and are extensions of corresponding lectures presented at the jubilee conference. This annual Symposium was launched by Budapest Tech (previously Budapest Polytechnic) and by the Hungarian Fuzzy Association in 2000, with the aim to bring together Hungarian speaking researchers working on computational intelligence and related topics from all over the world, but with special emphasis on the Central European Region. The Symposium of the 10 jubilee anniversary contained 70 reviewed papers. The growing interests, the enthusiasm of the participants have proved that the Symposium has become an internationally recognized scientific event providing a good platform for the annual meeting of Hungarian researchers. The main subject area called Computational Intelligence includes diverse topics. Therefore, we offer snapshots rather than a full coverage of a small particular subject to the interested reader. This principle is also supported by the common national root of the authors. The book begins with Information Systems and Communication. This part contains papers on graphs of grammars, software and hardware solution for Mojette transform, statistical intrusion detection, congestion forecast, and 3D-based internet communication and control.

**Bibliography of Books and Published Reports on Gas Turbines, Jet Propulsion and Rocket Power Plants**

**Commercial Aircraft Propulsion and Energy Systems Research**

This book is intended for advanced undergraduate and graduate students in mechanical and aerospace engineering taking a course commonly called Principles of Turbomachinery or Aerospace Propulsion. The book begins with a review of basic thermodynamics and fluid mechanics principles to motivate their application to aerothermodynamics and real-life design issues. This approach is ideal for the reader who will face practical situations and design decisions in the gas turbine industry. The text is fully supported by over 200 figures, numerous examples, and homework problems.

**Gas Turbine Performance**

The Federal Aviation Administration’s Airplane Flying Handbook provides pilots, student pilots, aviation instructors, and aviation specialists with information on every topic needed to qualify for and excel in the field of aviation. Topics covered include: ground operations, cockpit management, the four fundamentals of flying, integrated flight control, slow flights, stalls, spins, takeoff, ground reference maneuvers, night operations, and much more. The Airplane Flying Handbook is a great study guide for current pilots and for potential pilots who are interested in applying for their first license. It is also the perfect gift for any aircraft or aeronautical buff.

**NASA Technical Note**

This book is an introduction to the design of modern civil and military jet engines using engine design projects.

**Computational Intelligence and Informatics**

The grandest accomplishments of engineering took place in the twentieth century. The widespread development and distribution of electricity and clean water, automobiles and airplanes, radio and television, spacecraft and lasers, antibiotics and medical imaging, computers and the Internet are just some of the highlights from a century in which engineering revolutionized and improved virtually every aspect of human life. In this book, the authors provide a glimpse of the new trends of technologies pertaining to control, management, computational intelligence and network systems.

**Influence of High-turbine-inlet-temperature Engines in a Methane-fueled SST when Takeoff Jet Noise Limits are Considered**

**Gas Turbine Engines for Model Aircraft**

**Small, low-cost, expendable turbojet engine**


**Pilot's Handbook of Aeronautical Knowledge**

in this book you will be able to design, manufacturing and test your own small turbojet engine. especially turbofan engine for UAV "Drones". you can build your own engine with easy way and learn how to use CFD with Turbojet engines.

**Aircraft Engine Design**

**NASA Conference Publication**

**Technical Data Digest**

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.

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