Pulse Jet Engine Design

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

Announcements for the following year included in some vols.

Analysis and Design of the Pulse-jet EngineASTIA Subject HeadingsROTARY WING TIP-MOUNTED PULSE-JET ENGINE STRUCTURAL, NOISE REDUCTION, VALVE PHASING AND ELECTRICAL ANALOGY INVESTIGATIONS.

Popular Science gives our readers the information and tools to improve their technology and their world. The core belief that Popular Science and our readers share: The future is going to be better, and science and technology are the driving forces that will help make it better.

Improvement of existing pulsejet engines resulted in engines having (1) a 425-fps design speed with a maximum over 500 fps, (2) a design-speed life exceeding 41 hr, (3) a 444-g design-acceleration loading with a maximum over 575 g, and (4) a specific thrust of 2.23. An analysis indicated that a 25% greater thrust is possible with a ducted engine at a 550-fps tip speed. Acoustic coupling of 2 engines with proximate tailpipes reduced the fundamental-frequency noise level. Exhaust-shroud design requirements were established for shrouds which enhance acoustic coupling and which do not adversely affect static performance. Opposed-engine configurations further reduced the noise level and favorably affected performance. The inlet noise level was not reduced by acoustically coupling /4 ducts. A capacitance-type pressure pickup with a 1.25- mc carrier frequency and a 50-psi maximum was used with a high-impedance probe to determine engine-pressure variations. Average inlet-valve operating temperatures of 145 deg F may permit the use of strain gages as inlet-valve position indicators. Inlet-valve natural frequency and damping characteristics could not be determined with commercial vibration equipment. Studies of electrical analogies for engine analysis provided (1) a basic circuit demonstrating the analogous behavior of electrical circuits and pulsejet engines, (2) a relaxation oscillator providing repetitive analogy operations and simulating combustion, (3) an artificial electrical line simulating acoustic resonant characteristics, and (4) a determination of engine-tube resonant modes.

The escalating use of aircraft in the 21st century demands a thorough understanding of engine propulsion concepts, including the performance of aero engines. Among other critical activities,gas turbines play an extensive role in electric power generation, and marine propulsion for naval vessels and cargo ships. In the most exhaustive volume to date, this text examines the foundation of aircraft propulsion: aerodynamics interwoven with thermodynamics, heat transfer, and mechanical design. With a finely focused approach, the author devotes each chapter to a particular engine type, such as ramjet and pulsejet, turbojet, and turbofan. Supported by actual case studies, he illustrates engine performance under various operating conditions. Part I discusses the history, classifications, and performance of air breathing engines. Beginning with Leonardo and continuing on to the emergence of the jet age and beyond, this section chronicles inventions up through the 20th century. It then moves into a detailed discussion of different engine types, including pulsejet, ramjet, single- and multi-spool turbojet, and turbofan in both subsonic and supersonic applications. The author discusses Vertical Take Off and Landing aircraft, and provides a comprehensive examination of hypersonic scramjet and turbo ramjet engines. He also analyzes the different types of industrial gas turbines having single-and multi-spool with intercoolers, regenerators, and reheaters. Part II investigates the design of rotating compressors and turbines, and non-rotating components, intakes, combustion chambers, and nozzles for all modern jet propulsion and gas turbine engine systems, along with their performance. Every chapter concludes with illustrative examples followed by a problems section; for greater clarity, some provide a listing of important mathematical relations.

Vergeltungswaffen, retaliatory weapon, was a term coined during the Second World War to represent some Wunderwaffe, miraculous weapons, that Germany was developing. The "miracle" weapons, according to the propaganda, would have given a clear technological superiority of the German army and would have radically changed the course of the conflict, which has now clearly turned in favor of the Allies. The most famous Wunderwaffe, as well as some of the few to have been completed and widely used, were the Vergeltungswaffe, "vengeance weapons"; most still Wunderwaffe remained at the project level, as the German military nuclear program, or prototypes, such as the Panzer VIII Maus. Among the most famous are cited: the V1 flying bomb, the fighter interceptor Bachem Ba 349 Natter, the rocket V2, Wasserfall anti-aircraft missile, the V3 cannon and the cannon 21 cm K 12 (E). While the V1 can be considered a first draft of cruise missile, as it was flying on a cruise route to the target before you fall on the objective, the V2 rocket was the first real man-made and used in an armed conflict. Initially these weapons had their own names, but for the purposes of propaganda, Joseph Goebbels coined the name Vergeltungswaffen, "retaliatory weapons", since they were the first to bomb British popular districts of German cities, slaughtering innocent civilians.

The U.S. Air Force Tactical Missiles, 1949-1969, The Pioneers offers the rich, fascinating history of the first surface-to-surface tactical missiles of the U.S. Air Force, the winged, nuclear-capable Matador and Mace missiles, and their units and personnel in West Germany, Taiwan, Korea, Okinawa and the United States. The U.S. Air Force Tactical Missiles, 1949-1969, The Pioneers ties that unique era and those of other tactical missiles together in a remarkably broad, deep and valuable perspective that also includes the World War II German V-1 and reaches back all the way to the first flight in the United States in 1916 of an aircraft not controlled by a pilot.

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 turbinesfrom 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 o

;Contents: Superconductivity; Auxiliary power units; Electrical power generation and distribution; Power distribution--hydraulic and pneumatic.

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Theoretically derived charts showing steady-state and first- and second-harmonic flapping coefficients are presented for helicopter rotors having hinged rectangular blades with a linear twist of 0, -8, and -16 degrees. The charts, showing the rotor flapping coefficients for combinations of inflow ratio and blade pitch angle, are presented for tip-speed ratios ranging from 0.05 to 0.50.

This book focuses on the most important applications of fabric filtration: environmental protection, particulate control from combustion sources. It summarises the types of fibers and their properties and gives an overview of textile processing.

In an attempt to highlight the severity of the appropriation and manipulation of science and technology, Mike Bennett investigates the history of both from a revolutionary new perspective. He takes a unique look at the combined history of science and technology, detailing examples of manipulation of ground-breaking science by the intelligence community. One such example is that of Wernher von Braun. When he was taken to America in 1945, it was kept from the general public that von Braun was a Major in the SS, reporting directly to SS General Hans Kammler, who had been using slave labour from the concentration camps to build V2 rockets. Kammler's achievements and the towering advances made by his group of scientists and engineers were truly ground-breaking and the security system that he put in place to surround and protect these operations was never broken. This marked the start of what we now refer to as black project operations, and the system has since been replicated worldwide. Focussing on the manipulation of technological advances, A Brief History of Science with Levityencourages readers to look more closely at the information disclosed to us about modern science. An extensively researched book, it is full of primary sources, ranging from leading politicians to leaders of rogue nations, diplomats to common thieves and billionaire heads of industry to beggars. This book will appeal to those interested in science and history.

The International Space Station (ISS) is the largest man-made structure to orbit Earth and has been conducting research for close to a decade and a half. Yet it is only the latest in a long line of space stations and laboratories that have flown in orbit since the early 1970s. The histories of these earlier programs have been all but forgotten as the public focused on other, higher-profile adventures such as the Apollo moon landings. A vast trove of stories filled with excitement, danger, humor, sadness, failure, and success, Outposts on the Frontier reveals how the Soviets and the Americans combined strengths to build space stations over the past fifty years. At the heart of these scientific advances are people of both greatness and modesty. Jay Chladek documents the historical tapestry of the people, the early attempts at space station programs, and how astronauts and engineers have contributed to and shaped the ISS in surprising ways. Outposts on the Frontier delves into the intriguing stories behind the USAF Manned Orbiting Laboratory, the Almaz and Salyut programs, Skylab, the Apollo-Soyuz Test Project, Spacelab, Mir station, Spacehab, and the ISS and gives past-due attention to Vladimir Chelomei, the Russian designer whose influence in space station development is as significant as Sergei Korolev's in rocketry. Outposts on the Frontier is an informative and dynamic history of humankind's first outposts on the frontier of space.

This book provides a comprehensive basics-to-advanced course in an aero-thermal science vital to the design of engines for either type of craft. The text classifies engines powering aircraft and single/multi-stage rockets, and derives performance parameters for both from basic aerodynamics and thermodynamics laws. Each type of engine is analyzed for optimum performance goals, and mission-appropriate engines selection is explained. Fundamentals of Aircraft and Rocket Propulsion provides information about and analyses of: thermodynamic cycles of shaft engines (piston, turboprop, turboshaft and propfan); jet engines (pulsejet, pulse detonation engine, ramjet, scramjet, turbojet and turbofan); chemical and non-chemical rocket engines; conceptual design of modular rocket engines (combustor, nozzle and turbopumps); and conceptual design of different modules of aero-engines in their design and off-design state. Aimed at graduate and final-year undergraduate students, this textbook provides a thorough grounding in the history and classification of both aircraft and rocket engines, important design features of all the engines detailed, and particular consideration of special aircraft such as unmanned aerial and short/vertical takeoff and landing aircraft. End-of-chapter exercises make this a valuable student resource, and the provision of a downloadable solutions manual will be of further benefit for course instructors.

Soviet Mixed Power Experimental Fighter Aircraft Piston-Liquid Propellant Rocket Engine/Piston-Ramjet/Piston-Pulsejet & Piston-Compressor Jet Engine Designs of the 1940's The intent of this research paper is to provide an overview of the Soviet experimental fighter aircraft programs employing mixed power plants - piston-liquid propellant rocket engine, piston-ramjet, piston-pulsejet and piston-compressor jet engine accelerator technology, in the World War II and early post war period of the 1940's. A number of piston fighter aircraft types were converted for experimental roles from the Design Bureaus of Lavochkin and Yakovlev to test liquid propellant rocket engines and ramjet accelerators to increase maximum speed of in-service fighter aircraft, Sukhoi also developing the purpose designed Su-7 as a piston-liquid propellant rocket engine powered aircraft. Lavochkin also tested pulsejet accelerators on the La-7 and La-9 piston engine fighter families whilst Mikoyan, Sukhoi and Yakovlev tested piston-compressor jet engine accelerators. The latter employed a conversion from a serial piston engine fighter whist Mikoyan and Sukhoi developed new designs for their respective piston-compressor jet engine accelerator test programs. As no design provided the necessary combination of speed performance and reliability, the respective piston-liquid propellant rocket engine, piston-ramjet, piston-pulsejet and piston-compressor jet engine development programs, all of which were unreliable and over complex in their operation, would fall by the wayside due to the promise of better performance from the first generation exclusively jet powered fighter aircraft designs.