Preface

This book is an outgrowth of my lectures to undergraduate and postgraduate students in aerospace engineering at the Indian Institute of Technology, Madras, India. Before the first course in aircraft propulsion is offered, it is expected that the student has already undergone a course in both thermodynamics and gasdynamics and has a sufficient understanding of the laws of fluidmechanics. The actual course material is divided into two parts. In the first part, the aircraft propulsion systems, including ramjet, straight turbojet, small bypass jet, and large bypass fanjets, and piston engines are treated in systems approach, in which certain amount of fuel mass and energy are introduced without really considering the flow inside the blade rows. The equations are written in terms of nondimensional parameters for analysis in ideal cycles, or in terms of dimensional performance parameters in a real gas system. This part has been analyzed with the help of one cycle analysis code written in Fortran and given along with the text in this book. The engine parameters of a large number of piston engines, turboprops, and turbojets are also included as an appendix in this book, and will be made available online as spreadsheets on the book's webpage at www.springer.com. It is expected that the reader will use them in deepening his or her understanding of the subject and update also the data from time to time from the Internet. The files may be copied for personal use, but commercial exploitation is not allowed. In the second part, the subject of the design of aircraft gasturbines is treated more exhaustively and the results are compared with the engines, which either were designed earlier or currently exist. While preparing the second part, however, I had difficulties in referring to books on aircraft engines that would be suitable for teaching the subject, which is the prime motivation for writing this book. However, some of the books that I consulted during the preparation of the course lectures and the manuscript of this book are given in the Bibliography, and any reproduction of figures has been acknowledged. For example, the figures prepared by reproducing figures in Traupel's famous work, *Thermische Turbomaschinen*, are given after explicit permission was granted by the publisher, Springer.

Much of the information was taken from unknown authors on the Internet. Thanks to all of them. Readers of this book are strongly encouraged to browse the Internet to collect information.

To a large extent, I wrote this book (text and graphics) myself on a personal computer. In the early stage of writing the manuscript, while I was still at the Indian Institute of Technology in Madras, some of the text was typed on a PC by Jayanthi and some graphics were made by a number of my students; my hearty thanks to them. At that stage I used the Corel Ventura program. Unfortunately, at a later date, Corel Ventura's subsequent version was not compatible with the PC's operating system and so I had to convert my work line by line into the WINWORD editor. This process involved difficulties in putting the engine database in ASCII format into Word format, and hence it was decided to put the matter separately. Unfortunately, all that is new in WINWORD is not good, and what is good there is not new. Thanks go to Dr. M. Ramakanth for help with various publication issues and to the anonymous reviewers for making very useful suggestions. Thanks go also to my wife, Preetishree, for maintaining a congenial environment for writing the book, and also to my three children, Mohua, Mayukh, and Manjul, for bearing with me while writing this book, especially Manjul for procuring some necessary software.

I also would like to thank Springer New York for taking lot of interest in publishing this book following their exacting high standards.

I am now retired from the Indian Institute of Technology in Madras. I worked for some time in California but am now back in Kolkata. My e-mail address is bose.tarit@gmail.com. I look forward to suggestions, reactions, or discussions with readers through e-mail.

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