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HARRIS BOOTH

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EDITORIAL NOTE

THE DIRECTLY-USEFUL TECHNICAL SERIES requires a few words by way of introduction. Technical books of the past have arranged themselves largely under two sections: the Theoretical and the Practical. Theoretical books have been written more for the training of college students than for the supply of information to men in practice, and have been greatly filled with descriptions of an academic character. Practical books have often sought the other extreme, omitting the scientific basis upon which all good practice is built, whether discernible or not. The present series is intended to occupy a midway position. The information, the investigations, and the problems are to be of a directly-useful character, but must at the same time be wedded to that proper amount of scientific explanation which alone will satisfy the inquiring mind. We shall thus appeal to all technical people throughout the land, either students or those in actual practice.

AUTHOR'S PREFACE

THE science of Aeroplane Performance Calculations has become extremely important with the rapid advance of Aeronautics and has been developed to a very high degree. The Author has experienced considerable difficulty, however, in finding any detailed literature on the subject, and it is for this reason that he has written this book in the hope that Aeronautical Engineers and Designers will find it useful in supplying their special need for a practical and up-to-date handbook. As Designers will be aware, the restricted information published up to the present time has scarcely touched the fringe of the subject, and it is hoped that the readers of this book will find it to be a comprehensive and efficient instrument for saving time, since Aeroplane Performance Calculations can be very laborious if a clear and systematic method is not used.

The Author has given a considerable amount of thought and attention to the arrangement of the subject matter, and has divided it into three parts, namely:—

- Part I. Descriptive and Theoretical.
- Part II. Practical Procedure.
- Part III. Illustrative Examples.

The Aeronautical Engineer, using the volume as a handbook in his office, will find Part II. of greatest service to him, and for this reason all the formulæ, data, and curves required are collected in this part, which, being in the middle, is easier to keep lying open on the desk whilst in use than the end sections would be. This centre part also contains directions for use of formulæ, and forms of tables for use in calculating—a feature which will be found a great time-saver.

In case any process given in Part II. is difficult to follow, reference should be made to Part III., which consists of numerical examples worked out at length. Doubt as to the validity of any formula in Part II. can readily be dispersed by reference to Part I., which contains the mathematical proofs.

Students, however, would be better advised to study Part I. very carefully, before using other sections, in order to obtain a clear idea of the theory upon which the later work is based.

The last chapter of the book contains complete performance calculations for one machine; this shows the application of the methods better than do individual examples, and, moreover, gives an idea of the amount of work usually involved in a complete set of calculations. It also indicates the order in which these calculations generally have to be taken in practice.

As far as is feasible and reasonable the technical terms and symbols laid down by the Royal Aeronautical Society in their Glossary have been employed. An exception is the use of the term "propeller" instead of "airscrew," following the lead of Mr. H. C. Watts. Other exceptions are chiefly due to the fact that the Glossary does not cover nearly all the ground of the present book.

Acknowledgments are due to Messrs. Harold Bolas, H. C. Watts, and G. E. Petty for permission to make use of their work; as for the numerous test results, of which use has been made, these form part of the great debt owed by the Aeronautical Engineer to the National Physical Laboratory. The Author also wishes to take this opportunity of tendering his grateful thanks to Mr. G. E. Petty for the invaluable assistance he has given by verifying the whole of the mathematical and numerical work.

It is hoped that few errors exist in the book, but an indication of necessary corrections or suggestions for improvement in any future edition would be welcomed.

HARRIS BOOTH.

LONDON, *March*, 1921.