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SPHEROGRAPHICAL NAVIGATION



CAPTAIN P.V.H. WEEMS FOREWORD BY

The Spherographical System gives directly and visually THE LATITUDE AND LONGITUDE server, by the simple plotting of on the Sphere. It is NOT one ing the spherical triangle *

Spherographical Navigation

DIRK BROUWER, F. W. KEATOR, and DRURY A. McMILLEN THIS book is a manual of instruction on a system of celestial navigation While the system is based upon principles which are of considerable antiquity, it is new in the sense of its instrumentation and in its practical application to the solving of the problem of position. Reduced to its simplest terms, the Spherographical System embodies the use of a spherical plotting surface on which a fix of position is obtained by the direct plotting of the quired; and no tables are necessary except the American Air Almanac or the Nautical Almanac. No solution of the spherical triangle is made for the computed altitude based upon either altitudes of selected celestial bodies. Practically no calculations are rethe dead reckoning position or an ascalled Spherographical Navigation. sumed position.

Aside from the simplification of the solution provided by the method, and the speed with which a solution can be

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and the full-fledged navigator. will be necessary for both the beginner tice in using the instruments, and this of solution is attained only with pracconstruction in a few hours. Accuracy the instruments and the methods of acquaint himself with the operation of time; an accomplished navigator can celestial navigation, can learn the the learner has a visual picture of his This is very largely due to the fact that the ease with which it can be learned obtained, a distinct advantage lies in method in approximately three weeks beginner, without previous training in problem before him at all times. The

THE AUTHORS

able experience in flying over country a sportsman flyer he has had considerto a foreigner by the Brazilian Governonly private pilot's license ever issued Aéronautique Internationale and the lacking. He holds an international where radio aids to navigation are as a check on the dead reckoning and form of celestial navigation to be used their absence. He soon came to realize where landmarks are conspicuous by Scientific School, Yale University. As Brazil, is a graduate of the Sheffield and engineer living in São Paulo, Drury A. McMillen, a businessman pilot's license from the Fédération the necessity of a quick and simple

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ment. He wrote a book on celestial navigation which was published in Brazil under the title "Navegação Aerea." While preparing this volume he became acquainted with the Chief Astronomer of the São Paulo Observatory, Anton Stuxberg, to whom he expressed his dissatisfaction with the conventional methods of celestial navigation. The flyer and the scientist worked together to develop the system in its essential form. For his contribution to the art of navigation Mr. McMillen was made a Knight of the Order of the Southern Cross by the Brazilian Government.

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Soon after completing his work with Dr. Stuxberg, he brought the results of the work to the United States and, quite naturally, he turned to his alma mater. The President of the University, to whom he presented his case, asked two Yale faculty members, Messrs. Brouwer and Keator, to examine the method. The latter were impressed by its possibilities; they recognized that its usefulness would depend primarily upon the accuracy of the sphere and its auxiliary instruments, and upon the ease with which the instruments could be operated. Consequently, they set about testing the method and suggesting improvements to the instruments. The Sphere and instruments are now being manufactured, and this book is the answer to the need for a manual to accompany them.

Dirk Brouwer has been a member of the staff of the Astronomical Observatory of Yale University since 1928. In 1941 he was appointed Director of this institution, which has an international reputation for its work in the precision measurement of astronomical photographs.

F. W. Keator is Assistant Professor of Mechanical Engineering in the Yale School of Engineering. For many years he has been a practical navigator in a number of long-distance ocean races; he has taught navigation to students in Yale and in the Civilian Pilot Training Program and elsewhere. He is author of the "Air Navigation Outline" published by the Weems System of Navigation.

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