Συστήματα ελέγχου αεροσκάφους

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Abstract

Aircraft control systems, whether conventional or automatic, are an integral part of aircraft design. Everyone involved in aircraft design or maintenance must have at least a basic understanding of how these systems work. The purpose of the textbook "Aircraft Control Systems" is to convey this knowledge in a comprehensive and understandable manner. The first chapter provides an overview of the basic principles of aerodynamics necessary for a complete understanding of the operating mechanisms of control systems. The second chapter presents the conventional methods of aircraft control through the movement of appropriate surfaces. The third chapter thoroughly analyzes static longitudinal and lateral-directional stability and the factors that determine it. The fourth chapter defines the linear and non-linear equations of aircraft motion. The fifth chapter presents the modeling of motion through aircraft transfer functions together with the characteristics of dynamic stability. The sixth chapter briefly describes the concept of flight performance. The seventh chapter presents a summary of the basic concepts of classical automatic control theory with an emphasis on the root locus method. The eighth chapter provides examples of adding artificial stability to improve flight performance. The ninth chapter presents the design of simple automatic pilots and describes the basic principles of the ILS system. The tenth chapter analyzes the basic concepts of state space modeling. The eleventh and final chapter applies these concepts to aircraft motion modeling and the design of automatic control systems. In the eleventh and final chapter these concepts are applied to aircraft motion modelling and to the design of automatic control systems.