1. Record Nr. UNINA9910819946403321

Autore	Babister A. W.
Titolo	Aircraft dynamic stability and response / / A. W. Babister
Pubbl/distr/stampa	Oxford, England : , : Pergamon Press, , 1986 ©1980
ISBN	1-4831-4035-0
Edizione	[First edition.]
Descrizione fisica	1 online resource (247 p.)
Collana	Pergamon International Library of Science, Technology, Engineering and Social Studies
Disciplina	629.13236
Soggetti	Stability of airplanes Airplanes - Handling characteristics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Front Cover; Aircraft Dynamic Stability and Response; Copyright Page; Table of Contents; Preface; List Of Symbols; NON-DIMENSIONAL FORMS OF THE AERODYNAMIC DERIVATIVES USED IN AMERICA; UNITS; Part I: FLIGHT DYNAMICS; Chapter 1.INTRODUCTION; THE GENERAL MEANING OF STABILITY; LONGITUDINAL STATIC STABILITY; STATIC MARGIN; STABILITY AND TRIM; MANOEUVRABILITY AND MANOEUVRE MARGIN; REFERENCES; PROBLEMS; Chapter 2. THE EQUATIONS OF MOTION; INTRODUCTION; THE GENERAL DYNAMICAL EQUATIONS FOR A RIGID AIRCRAFT REFERRED TO MOVING AXES DEFINITION OF THE ANGLE OF PITCH , THE ANGLE OF BANK AND ANGLE OF YAW RELATIONS FOR RATES OF ROLL, PITCH AND YAW; DETERMINATION OF THE GRAVITATIONAL FORCES; ANGLES OF YAW AND SIDESLIP; DETERMINATION OF THE AERODYNAMIC FORCES; SEPARABILITY OF LONGITUDINAL AND LATERAL MOTION; AXIS SYSTEMS USED IN STABILITY ANALYSIS; NON-DIMENSIONAL AERODYNAMIC DERIVATIVES (LONGITUDINAL); NON-DIMENSIONAL AERODYNAMIC DERIVATIVES (LATERAL); NON-DIMENSIONAL DISTURBANCES; NON-DIMENSIONAL MASS AND INERTIA; NON-DIMENSIONAL FORM OF THE EQUATIONS OF MOTION; THE MOTION OF THE CENTRE OF GRAVITY OF THE AIRCRAFT REFERENCESPROBLEMS; Chapter 3. AERODYNAMIC DERIVATIVES

(LONGITUDINAL); INTRODUCTION; FORCE VELOCITY DERIVATIVES Xu, Xw, Zu, Zw; INCIDENCE CHANGE ASSOCIATED WITH CHANGE IN VELOCITY COMPONENTS; PITCHING MOMENT DERIVATIVES Mu, Mw; DERIVATIVES DUE TO RATE OF PITCH Xq, Zq, Mq; DERIVATIVES DUE TO RATE OF CHANGE OF DOWNWARD VELOCITY X'w, Z'w, M'w; CONTROL DERIVATIVES; NON-DIMENSIONAL FORMS OF THE AERODYNAMIC DERIVATIVES USED IN AMERICA; AMERICAN NON-DIMENSIONAL FORCE-VELOCITY DERIVATIVES cxu, cx, czu, cz,; AMERICAN NON-DIMENSIONAL PITCHING MOMENT DERIVATIVES Cmu, Cma
AMERICAN NON-DIMENSIONAL DERIVATIVES DUE TO RATE OF PITCH cxq, czq, cmqAMERICAN NON-DIMENSIONAL DERIVATIVES DUE TO RATE OF CHANGE OF DOWNWARD VELOCITY CxD, CzD, CmD; AMERICAN NON-DIMENSIONAL CONTROL DERIVATIVES Cxe, CZe, Cme DUE TO ELEVATOR; REFERENCES; PROBLEMS; Chapter 4. AERODYNAMIC DERIVATIVES (LATERAL); INTRODUCTION; ESTIMATION OF LATERAL STABILITY DERIVATIVES; DERIVATIVES DUE TO SIDESLIP; DERIVATIVES DUE TO RATE OF ROLL; DERIVATIVES DUE TO RATE OF YAW; CONTROL DERIVATIVES; DERIVATIVES DUE TO AILERONS; DERIVATIVES DUE TO RUDDER
NON-DIMENSIONAL FORMS OF THE AERODYNAMIC DERIVATIVES USED IN AMERICANON-DIMENSIONAL FORMS OF THE CONTROL DERIVATIVES USED IN AMERICA; REFERENCES; PROBLEMS; Part II: LONGITUDINAL DYNAMIC STABILITY AND RESPONSE; Chapter 5. BASIC LONGITUDINAL MOTIONS; INTRODUCTION; THE SHORT PERIOD OSCILLATION; THE PHUGOID (LONG PERIOD) OSCILLATION; PROBLEMS; Chapter 6. LONGITUDINAL DYNAMIC STABILITY; INTRODUCTION; STICK FIXED DYNAMIC STABILITY; THE GENERAL SOLUTION OF THE EQUATIONS OF MOTION; TYPES OF MOTION CORRESPONDING TO THE ROOTS OF THE CHARACTERISTIC EQUATION
ANALYSIS OF THE ROOTS OF THE CHARACTERISTIC EQUATION

Sommario/riassunto

Aircraft Dynamic Stability and Response deals with the fundamentals of dynamic stability in aircraft. Topics covered include flight dynamics, equations of motion, and lateral and longitudinal aerodynamic derivatives. Basic lateral and longitudinal motions are also considered. A non-dimensional system of notation is used, and problems are included at the end of chapters. This book is comprised of 13 chapters and begins with an introduction to aircraft static stability and maneuverability, with emphasis on the theoretical basis of flight dynamics and the technical terms used. The physical backgr