1. Record Nr. UNINA9910961035503321

Titolo	Flight control systems / / edited by Roger W. Pratt
Pubbl/distr/stampa	Herts, U.K., : Institution of Electrical Engineers Reston, Va., : American Institute of Aeronautics and Astronautics, c2000
ISBN	1-60086-655-7 1-60086-436-8
Edizione	[1st ed.]
Descrizione fisica	1 online resource (412 p.)
Collana	Progress in astronautics and aeronautics ; ; v. 184
Altri autori (Persone)	PrattRoger <1943->
Disciplina	629.135
Soggetti	Airplanes - Control systems - Design and construction Flight control
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 and index.
Nota di contenuto	""Cover""; ""Title""; ""Copyright""; ""Table of Contents""; ""Contributors""; ""Preface""; ""Glossary of terms""; ""Nomenclature""; ""Chapter 1 Industrial considerations for flight control""; ""1.1 Introduction ""; ""1.2 The general objectives of flight control ""; ""1.3 The role of the flight control system ""; ""1.4 Aircraft in-service requirements ""; ""1.5 The benefits of fly-by-wire ""; ""1.6 Flight control systems implementation ""; ""1.7 Military aircrafta€?state-of-the-art and future challenges ""; ""1.8 Civil aircrafta€?state-of-the-art and future challenges "" ""1.9 The flight control system development process """"1.10 Closing discussion ""; ""1.11 Acknowledgements ""; ""1.12 References ""; ""Chapter 2 Aircraft modelling""; ""2.1 Introduction ""; ""2.2 A mathematical framework ""; ""2.3 Axes systems and notation ""; ""2.4 Euler angles and aeroplane attitude ""; ""2.5 Controls notation ""; ""2.6 The decoupled small-perturbation equations of motion ""; ""2.7 The equations of motion in state-space form ""; ""2.8 Aircraft-response transfer functions ""; ""2.9 The transfer function matrix ""; ""2.10 Longitudinal response to controls "" ""2.11 Lateral-directional response to controls """"2.12 Conclusions ""; ""2.13 Reference ""; ""Chapter 3 Actuation systems""; ""3.1 Introduction ""; ""3.2 Actuation system technologya€?an overview ""; ""3.3 Actuation system-performance criteria ""; ""3.4 Actuation system modelling "";

	""3.5 Nonlinear frequency response ""; ""3.6 Saturation analysis ""; ""3.7 Jump resonance ""; ""3.8 Failure transients ""; ""3.9 Conclusions ""; ""3.10 Acknowledgements ""; ""Chapter 4 Handling qualities""; ""4.1 Introduction ""; ""4.2 Longitudinal flying qualities "" ""4.3 Lateral-directional flying qualities """"4.4 Stability and control-augmentation systems ""; ""4.5 Notes on some control design concepts ""; ""4.6 Pilot-induced oscillations (PIOs) ""; ""4.7 Modal PIO criteria ""; ""4.8 Non-modal PIO criteria ""; ""4.9 Effects of rate limiting on PIO ""; ""4.10 Concluding remarks ""; ""4.11 References ""; ""Chapter 5 Automatic flight control system design considerations""; ""5.1 AFCS development programme ""; ""5.2 Requirements definition and verification ""; ""5.3 System design considerations ""; ""5.4 AFCS architecture "" ""Chapter 6 Ground and flight testing of digital flight control systems"""""6.1 Introduction ""; ""6.2 Philosophy of flight testing ""; ""6.3 Aircraft ground testing ""; ""6.4 Flight test tools and techniques ""; ""6.5 Flight testing ""; ""6.6 Conclusion ""; ""6.7 Acknowledgements ""; ""6.8 References ""; ""Chapter 7 Aeroservoelasticity""; ""7.1 Introduction ""; ""7.2 Elements of structural coupling ""; ""7.3 FCS-SC structural coupling: design examples ""; ""7.4 Future developments ""; ""7.5 Conclusions ""; ""7.6 References "" ""Chapter 8 Eigenstructure assignment applied to the design of an autopilot function for a civil aircraft""
Sommario/riassunto	This text consists of two parts - the first providing the fundamentals of flight control system design, the second covering applications of modern control methods. It covers topics such as: industrial consideration for flight control; aircraft modelling; actuation systems; and handling qualities.