

Computers Take Flight: History of NASAs Pioneering Digital Fly-by-Wire Project (NASA History Series)



This 180-page work, a part of The NASA History Series, covers the entire history of NASAs F-8 digital flight project, from the first F-8C flight at Edwards Air Force Base in May 1972. It provides many insights into the nature of flight, and the problems of using advanced digital controls. The first chapter devotes many pages to details about the Wright Brothers experiments with flight stability, then discusses experiences with the Curtis JN-5 Jenny during World War I. There is a section devoted to the German A-4 (V-2) rocket, describing Von Brauns approach to rocket flight control. The text also covers the work of Avro Canada, designing the advanced Avro CF-105 aircraft--the first to use fly-by-wire (at least with the yaw damper). There is information about the development of fly-by-wire technology for the Mercury capsule, the Lunar Module of the Apollo spacecraft, and Boeings work on the X-20 Dyna-Soar project. There is plenty of physics and engineering mixed with the history, too--in fact, this book provides a good introduction to the entire subject of flight and its control. An entire chapter is devoted to the origins of NASAs involvement in fly-by-wire research, commencing with the Lunar Landing Research Vehicle (in 1961). The text describes in detail the digital systems used on the F-8C, F-18, F16, F-117, B-2, and F-22, as well as several commercial aircraft (like the Boeing 777 and Airbus A-320). The author explains the need for, and types of sensors involved in flight, as well as gyroscopic instruments, inertial measurement units, and the role of computers to integrate these devices. First analog computers are explained (starting with the ENIAC), then the subject turns to digital circuits. Effectors and actuators are described, along with the development and evolution of software to drive these systems. Youll relive the NASA experiences developing reliability for

fly-by-wire technology.

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