

Open-Loop Pitch Table Optimization for the Maximum Dynamic Pressure Orion Abort Flight Test



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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 48 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. NASA has scheduled the retirement of the space shuttle orbiter fleet at the end of 2010. The Constellation program was created to develop the next generation of human spaceflight vehicles and launch vehicles, known as Orion and Ares respectively. The Orion vehicle is a return to the capsule configuration that was used in the Mercury, Gemini, and Apollo programs. This configuration allows for the inclusion of an abort system that safely removes the capsule from the booster in the event of a failure on launch. The Flight Test Office at NASA's Dryden Flight Research Center has been tasked with the flight testing of the abort system to ensure proper functionality and safety. The abort system will be tested in various scenarios to approximate the conditions encountered during an actual Orion launch. Every abort will have a closed-loop controller with an open-loop backup that will direct the vehicle during the abort. In order to provide the best fit for the desired total angle of attack profile with the open-loop pitch table, the table is tuned using simulated abort trajectories. A pitch table optimization program was created to tune the trajectories in an automated fashion. The program development was divided into three phases. Phase 1 used only the simulated nominal run to tune the open-loop pitch table. Phase 2 used the simulated nominal and three simulated off nominal runs to tune the open-loop pitch table. Phase 3 used the simulated nominal and sixteen simulated off nominal runs to tune the open-loop pitch table. The optimization program allowed for a quicker and more accurate fit to the desired profile as well as allowing for expanded resolution of the pitch table. This item ships from...

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