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HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
How Can We Best Apply Our Experience to Future Human Missions? (2)

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DESCENT SYSTEMS FOR AN IMPROVED AND REUSABLE GEMINI CAPSULE

Abstract

Americans in Orbit-50 Years (AIO-50) is a non-profit organization that seeks to provide bi-annual commercial space flight launches into Low Earth Orbit (LEO) with an emphasis upon placing student designed experiments and satellites into orbit. Via the AIO-50 International Space Science Education Program (ISSEP), collaboration between the Mechanical and Aerospace Engineering (MAE) department at the University of Alabama in Huntsville (UAH) and AIO-50 was established. This partnership provides MAE senior design students manned space flight hardware design experience. Several design teams have designed and fabricated various hardware including a 1/3 scale model of a modified Gemini capsule and the landing gear. AIO-50 seeks to safely land, after atmospheric re-entry from LEO, a manned capsule on land – as opposed to an ocean splash down. The present paper describes the preliminary designs of a descent system developed by a senior MAE design team. In order to design this system extensive research was conducted regarding the original designs that the National Aeronautics and Space Administration (NASA) considered – including a rogallo wing and parafoil descent systems. The design team focused upon the creation of various preliminary designs of the capsule descent systems. Extensive technical analysis was completed and modeling and simulation tools such as Finite Element Analysis (FEA) were critical during the design process as experimentation and prototyping of the full scale system was not feasible. This paper describes the design team approach and details of the various preliminary capsule descent system designs generated by the MAE student design team.