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TÖRÖN I: AN AUTONOMOUS, RECOVERABLE AND REUSABLE PLATFORM FOR HIGH-ATMOSPHERIC STUDIES

Abstract

The Törön I ("bird" in the Pemon language), an autonomous, recoverable, and reusable platform for recording, storing, processing, and transmitting atmospheric scientific data, was a platform designed and launched by the Agencia Bolivariana para Actividades Espaciales (ABAE) in 2021 to develop scientific research capabilities to study the Earth's high atmosphere, while providing the agency with a testbed platform for nanosatellite technology to advance our knowledge of the Earth, the solar system, and the universe. Balloon research has been used in scientific investigations for many years. They are an inexpensive way to carry instrument payloads that conduct scientific investigations, and they can be launched from locations around the world. For ABAE, high-altitude scientific balloon platforms for engineering and scientific research represent an important milestone in achieving the goal of indigenous satellite capabilities. This paper presents the results of the first launch and all the steps taken to meet the mission requirements, from conceptual proposal through design, engineering, and construction. It also discusses the correct design and engineering decisions and the difficulties encountered during platform recovery, such as communications and tracking challenges. The results obtained will set the stage for Toron II, a more ambitious mission and an improved platform in terms of communications, positioning systems and scientific sensors.