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DESIGN OF A HIGH PERFORMANCE STUDENT SATELLITE: AUTSAT

Abstract

AutSat Project was established to design; manufacture, test and launch a micro satellite (less than 80 kg) to perform telemetry, remote sensing and store and forward data communication since 2007. The organization of this project was originally planned to perform multi-purpose team working projects on the basis of knowledge and capability of academic members as well as students of Amirkabir University of Technology. Main AutSat Project Objectives are: 1. Provide theoretical and practical learning process and environment for the students and faculty members to work together on a highly technical common project. 2. Fostering level of international cooperation through science and technology activities with other universities, organizations and research centers. 3. Design, manufacture, test and launch of a micro satellite (less than 80 kg) that able to perform telemetry, remote sensing and store and forward communication. The 661.1 km circular sun synchronous ($e = 0.0012$, $i = 98.04^\circ$) has been chosen based on studies conducted on piggyback launch possibilities, 7 day revisit time, low altitude atmospheric drag avoidance, higher altitude radiation exposure avoidance. The Mean Local Time (MLT) of ascending node has been chosen to be 10:30 A.M. No onboard thrusters have been considered for station keeping of the satellite. The engineering model of this satellite has been tested and approved and now the team is working to finalize the qualification test (structural, thermal and EMC tests) based on ECSS standard at the subsystem level to complete the Flight Model. This paper aims to present the recent progress in the AutSat Microsatellite project. First, the mission statement and the justification for of this student satellite will be presented. Then, we will describe the development of this project and its effect on the growth and expansion of the national space technology programs. In the last section the main achievements of this project up to the current stage will be discussed.