IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Hands-on Space Education and Outreach (8)

Author: Mr. Sajjad Ghazanfarinia
Satellite Research Institute, Iranian Space Research Center, Iran

SATELLITE FULL-SCALE REPLICA AS A HANDS-ON FOR ASSEMBLY AND INTEGRATION PROCESS TRAINING

Abstract

This article is about a hands-on designed and developed to help high school students learn about the difficulties of assembly and integration (AI) process in a satellite project. Many students can know the satellite system and components using conventional methods, but these methods is not effective enough for AI training. Instructors use videos and slideshows, but it is not comparable to real experience of a satellite integration. A full scale replica is then used to make the students feel the satellite components better and integrate by themselves. Layout of the replica was based on a satellite with modular design which let the students to assemble the component on each face of the satellite separately and integrate then. Replica is made up of Plexiglas to reduce the cost and components are assembled on the satellite using error-free easy assemblage bolts. The Training starts with an introductory presentation on satellite systems, components and integration and then is followed by students activity. A guideline had been prepared for the replica AI, so that students formed into 6 groups, each working on one face of the satellite, deliver their assembled face to another team for verification. The faces are then integrated into the full satellite model, while there are many technical points in this step that students will learn in practice, as they must disassemble and assemble again in order to make their set integrable to the other faces and shape the whole satellite. This 2-hour program showed a very positive feedback both from the students and instructors, as conveying concepts cannot be easier where they see a change from boring speeches to an interactive workshop. As the next step, the replica is going to be more attractive, using some moving mechanisms and simple electronics which little engineers (to be) will make them work by their hands.