

45th STUDENT CONFERENCE (E2)
Educational Pico and Nano Satellites (4)

Author: Mr. Geiner Gustavo Fonseca Naranjo
Universidad de Costa Rica, Costa Rica, geiner.fonseca@ucr.ac.cr

FIRST COSTA RICAN NANO SATELLITE GROUND BASE STATION: MATERIALIZING EFFORTS.

Abstract

In Costa Rica's recent years, state institutions, non-governmental organizations and academia, have united to introduce the country and Central America region in a competitive way into the aerospace field. Many of these efforts, led by the Central American Aeronautics and Space Association (ACAE for its Spanish acronym), have been developed by Costa Rican undergraduate students and researchers abroad. With the desire to materialize all these efforts, it emerged the work and research of installing a nano satellite communication ground base station.

This paper deals with the initial results of the design process and installation of the first LEO satellites ground base station of the Central America region. This ground base station, is based on a scheme of educational cooperation with other stations around the world, as the GENSO network worked. The Global Educational Network for Satellite Operations (GENSO network) consisted in a worldwide network of ground stations and spacecraft which can interact via a standard software. But its actual state is not clear, so this paper also suggest the maintenance of this networks or the creating of an international cooperation for a new one. This networks aim to increase the return from educational space missions and changed the way that these missions were managed before. The construction of this station will benefit the country for more economic investment. This work proofs that undergraduate students have the right tools and skills to lead an intermediate developed country to its incorporation in the space field. This is the one of the first concrete steps done in the country for the launch of the first Nano Satellite of the Central American region, Irazu Project, developed by ACAE and the two main universities in Costa Rica: Costa Rica Institute of Technology and University of Costa Rica.

As a result, this station will provide greater spatial and temporal coverage for the spacecraft (thus increasing the current temporal interval that many actual nano satellites space craft have). This will dramatically enhance the impact of the project because it will improve the redundancy of information (confirmation of transmitted information), increase the service life, higher return of investment and critical operations would be benefit from the ability to have global coverage. In addition, this project is a clear example that there are inexpensive alternatives for countries as Costa Rica to invest and participate in the aerospace industry.