

62nd International Astronautical Congress 2011

15th SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Small Satellite Operations (3)

Author: Mr. Ronnie Nader
Ecuadorian Civilian Space Agency (EXA), Guayaquil, Ecuador, rnader@exa.ec

CYCLOPS: REAL TIME VIDEO TRANSMISSION FROM ORBIT ON A 1U CUBESAT MISSION

Abstract

In order to meet the primary mission requirements for the NEE-01 PEGASUS spacecraft, the Ecuadorian Civilian Space Agency designed and built the CYCLOPS system, which allows our satellite to send a continuous real time video feed from orbit.

The main problem was not to meet the space restrictions of a 1U spacecraft, but to define the mathematical model for a downlink budget of a signal which bandwidth was 25 Mhz wide, arriving at the ground station antenna with an strength of -160 dbm and once such system was designed, the challenge was to solve the engineering problems associated to hyper amplification of very weak signal without suffering the effects of cascade signal blurring.

The CYCLOPS mathematical model was defined and so the system was built and tested both in laboratory and in the field, the result was a robust real time video transmission system that fits in a 1U cubesat structure capable of transmitting continuously from orbit.