

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
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DESIGN OF LOW COST GROUND STATION WITHOUT THE USE OF A FRONT-END AMPLIFIER

Abstract

Design of Ground Station system for a small satellite presents unique challenges and constraints with respect to system sensitivity, noise immunity and overall reliability of the system. Front-end amplifiers in a ground station provide improvement in sensitivity of the receiving system. Swayam is a 1U picosatellite developed by undergraduate students of College of Engineering, Pune (COEP), and launched by Indian Space Research Organization (ISRO), operating in LEO and communicating in the UHF amateur radio band. In the iterative development process of COEP Ground Station, it was observed that a reliable communication link can be established with Swayam without the use of a front-end low noise amplifier while maintaining a link margin of 5dB. This paper puts forth the link analysis performed for the reception of Swayam's telemetry data with and without the use of a front-end amplifier. Verifying these values with theoretical link margins, we propose a simple low cost ground station system eliminating the use of a front-end amplifier.