

Antenna System with Tracking Capability for Low-Earth Orbit Satellite Communications

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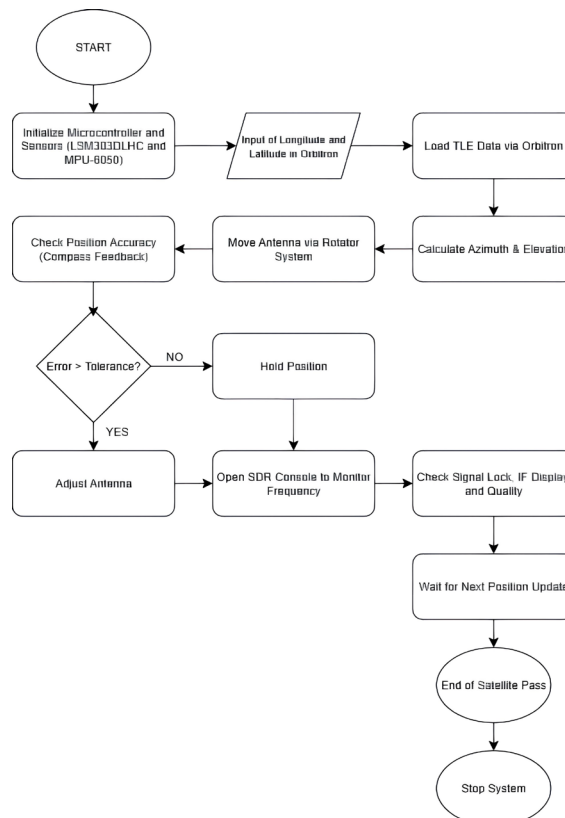
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Abstract

Global communication networks have been modified by introducing Low Earth Orbit (LEO) satellite constellations, which have increased connectivity and provided extensive coverage. However, considering the rapid movement of LEO satellites across the vast expanse of space, maintaining dependable communication links proves to be challenging. In order to overcome this and enable the ideal communication with LEO satellites. To address this issue, this research studies the creation and evaluation of an antenna system with a tracking mechanism by providing a unique antenna design with an integrated tracking mechanism. This study adds to the advancement of LEO satellite communications. The system is tested through multiple satellite tracking trials to measure tracking efficiency, dwell time, and signal reception quality. Results show that the proposed setup can effectively maintain signal lock during LEO satellite passes, making it suitable for real-time data reception and transmission. The findings would be useful for satellite communication engineers, antenna designers, and system operators as they contribute to the development of more efficient and reliable communication infrastructure for LEO satellite constellations, subsequently driving advancements in sectors such as telecommunications, remote sensing, and Internet of Things (IoT) applications.



Keywords

Low earth orbit, antenna tracking system, tracking mechanism, satellite, telecommunications.