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GROUND STATION AND INFRASTRUCTURE DEVELOPMENT AT THE UNIVERSITY OF ALABAMA, TUSCALOOSA

Abstract

Multiple partners at the University of Alabama are planning for an expanded small satellite program. While interests vary from remote sensing of glacial ice masses to testing of small Hal thrusters on-orbit, there is currently no ground infrastructure at the university. To support future satellite and space-based research, an investment has been made towards a small, permanent ground station. The autonomous ground station will help fill the current ground infrastructure gap operating in frequencies from VHF to UHF. It will be connected to a network service for easy access and distribution of satellite data, greatly increasing the capabilities of the ground infrastructure.

Based on a survey of platforms and network solutions, the ground station is to be established as a VHF and UHF network node on the SatNOGS network. SatNOGS, an open network, was selected as an alternative to high cost commercial solutions.

The build, verification, and operational assessments of the ground station are presented.The decision to use a SatNOGS open-source rotator design was a significant time cost compared to commerical rotators. The ground station can support low-Earth-orbit satellites operating in the VHF and UHF frequency range. It has completed 20 observations for verification as of March 6. Planned upgrades include the addition of Ka-band communication equipment.

The permanent ground station, operating in the VHF and UHF range and enabling access to the SatNOGS network, provides infrastructure to support an expanding small satellite program at the University of Alabama. This addition gives University of Alabama students, staff, and faculty a low-cost alternative to commercial ground station services that can be used both in the classroom and in research.