



MOREHEAD STATE UNIVERSITY

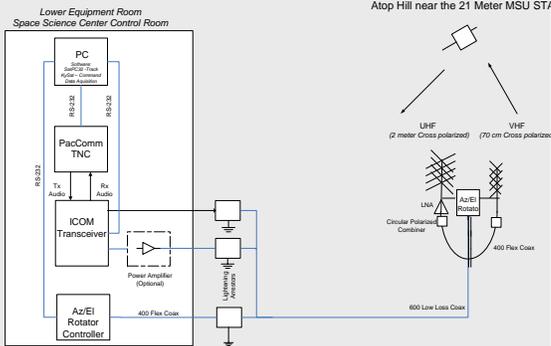
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20 Ft. Parabolic Dish Antenna in Storage at the Support Services Complex.

Morehead State University



VHF/UHF Antenna System Block Diagram (above) and picture (below). The VHF/UHF System will be the primary low bandwidth control station for KySat-1.



40 Foot, 24 Foot, and 20 Foot Space Tracking Antennas

Key infrastructure is currently on-hand to develop additional full motion parabolic dish space tracking systems—a 40 foot, a 24 foot, and two 20 foot diameter system. These additional ground resources will serve as space tracking antennas to support the astrophysics and satellite telecommunications programs and satellite operations support. The primary function of both is to serve as a redundant system to the 21 Meter antenna. NASA contracts require a 99.98% data return rate for telemetry missions and redundant systems are necessary to provide this level of accuracy. Additionally, both systems will be designed to support specific missions such as NASA launch and early orbit support (LEOS) services. These systems will be designed to support essentially the same science program as the 21 Meter, but at lower gain. Students will be intimately involved in the development of these systems including engineering the electromechanical drive systems, interfacing and feedback systems, software development for automation and control of the system, software development for data collection and analysis, and in the operation of these space tracking systems.

The 13 meter reflector is slated for refurbishment and a series of feeds will be designed to replace the current C-band prime focus system, permitting use in L, S, C, and low X bands (1-10 GHz).

VHF/UHF Satellite Ground Station

The VHF/UHF satellite ground station is a stand-alone facility operated by MSU as the primary low bandwidth Earth station of the KySat project. This station is comprised of hardware and software that permits the auto-acquisition and tracking of low earth orbiting satellites for the purpose of command, communications and control. It is primarily built from commercial off the shelf hardware and uses readily available shareware for the tracking and communication portions of the software task. It uses a well established architecture developed by the Amateur Radio Community for similar projects, and makes use of amateur frequencies for the purposes of Earth-to-space and space-to-earth communications. Collectively, these instruments provide unique educational tools that serve as active laboratories for students to have hands-on learning experiences with the intricacies of satellite telecommunications.