

**Deformable Mirror High Voltage Power Supply Remote Control
and
High Voltage Amplifier Card Test Set Up**

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Adaptive Optics (AO) is used to correct for the “blurriness” caused by atmospheric turbulence. The Advanced Electric Optical System (AEOS) telescope located atop Haleakala has one of the world’s most advanced AO systems. The heart of the AO system is a deformable mirror (DM). The DM is controlled by 941 actuators, which bend the mirror, in real time, to help correct the distorted images. Two high voltage power supplies drive these actuators. Currently the power supplies are controlled locally, by simply turning two knobs until the desired voltage levels are met, however, it would be optimal if these power supplies could be remotely controlled and monitored using a PERP control system. The power supplies malfunctioned twice, because it was drawing too much current. Modifications need to be made to the power supplies to function at its optimal level. Schottky diodes will be used to protect against the current overflow. Another component of the AO system is the High Voltage Amplifier Cards (HVA Cards). Each HVA card drives eight actuators on the DM. The HVA cards need to be calibrated and tested from time to time and the existing test set up is insufficient. A new test set up was designed using a CPLD Xilinx Programmable Logic Device to send commands to the HVA cards, and high power resistors to measure the current at the output. The test setup that currently exists is a static test and it does not serve much purpose. It is used only for calibration purposes, but the new, dynamic test setup will test the boards’ efficiency and specifications.