



## MULTIPLE MIRROR TELESCOPE OBSERVATORY

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MMTO Technical Memorandum 86-1

Re: Offset Autoguiding with the SAO-CCD

From: C. Janes and J. Montgomery

Date: June 17, 1986

Offset autoguiding was first used successfully at the MMT for recording automatically coaligned images of faint optical objects by Drs. Rudy Schild and Peter Eisenhardt on June 9th and 10th, 1986. This is a report on that observing run from an engineering viewpoint. The reader not familiar with the top box and autoguiding procedure should review MMTO Publications 86-9, 86-10, and MMTO Internal Technical Memorandum 85-5.

### The Setup

The instrument used for the experiment was the SAO-CCD, more commonly used at the Whipple 24" telescope. The camera consists of a dewar-mounted RCA CCD (512 x 320) with a focal plane aperture of approximately 2 x 3 1/2 arc-minutes. The reflectivity of a beam splitter at the focal plane is 4% across the aperture. The remainder of the focal plane is aluminized for roughly 90% reflectivity. SAO software was used on the MMT instrument computer to collect and display the images via the instrument Grinnell. The data were recorded on magnetic tape and will be analyzed in detail in Cambridge. Resolution of the SAO-CCD is 0.3 arcseconds per pixel.

The MMT top box and the Telescope Coalignment System (TCS) were used for the autoguiding control. The MMT intensified CCD (I-CCD) had failed prior to this run, so it was necessary to borrow the I-CCD from the 24" and install it in the top box. Otherwise the top box configuration was as described in previous memoranda.

### The Whipple I-CCD

The Whipple I-CCD fits readily in the MMT top box. D. Blanco had made an adapter flange to match the bolt hole patterns. The electronics package and power supply were fastened to a door off the old top box and installed on the new top box. The intensifier for the Whipple CCD is controlled with a remote paddle which connects to the camera via a standard coaxial cable. The levels of the composite video from the Whipple CCD were sufficiently different from the MMT CCD that the CVI sync stripper required to feed timing to the TCS Grinnell had to be replaced with a different model.

The camera rotator motor had insufficient torque to turn the camera, possibly because of the short stiff cables connected to the camera. The axes were aligned by hand instead.