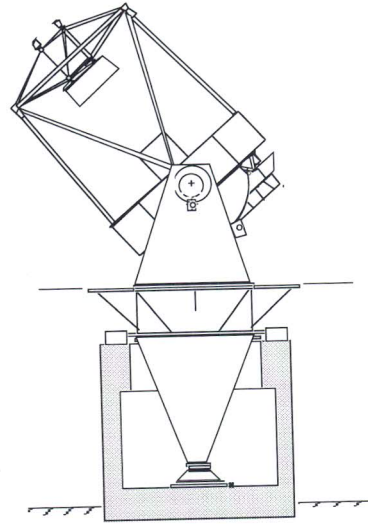


WISCONSIN  
INDIANA  
YALE  
NOAO



3.5 METER TELESCOPE

**WIYN Operations Readiness Review:  
MOS/Hydra Report**

**WODC 02-41-01**

# Operational Readiness Review – Hydra/WIYN

S. Barden

February 1, 1996

# 1 Introduction

The requirements and goals for the MOS instrument, Hydra, are addressed in this document. Issues relating to the focal plane through light passing through the fibers will be covered. The Bench Spectrograph is described in a separate report.

## 2 Requirements and Performance

The following description is from WODC 00-01-05:

Description: Robot for positioning fiber optics in the focal plane of the MOS port. HYDRA will mount directly to the instrument rotator and place its focal plane at the appropriate position as specified. The fibers will pipe light to a spectrograph off the telescope. Means will be provided for acquiring the field and for sensing guide errors, field rotation, and focus errors. An alignment camera with the ability to simultaneously view the superimposed images of the fiber and program object will provide a check of fiber positioning.

### As Built Instrument:

Hydra mounts to the MOS rotator along with a spacer assembly which houses Cu-Ar and Th-Ar calibration lamps.

The focal surface of the instrument was matched to that derived from the best estimate of the as-built optical design (see Science and Technical Requirements Review).

The fiber optics feed down the telescope cone, through the azimuth bearing and into the spectrograph laboratory where they are interfaced to a Bench Spectrograph (See Review for the Bench Spectrograph).

Field acquisition is achieved through use of the ICCD camera that rides on the robotic gripper. The camera sees an image of the sky superimposed on a view of the focal plate. LEDs on the gripper provide illumination of the focal plate and fiber buttons. LEDs on the spectrograph can provide back illumination of the fiber optics for direct viewing of the fiber apertures.

Guider error sensing is achieved by sampling the image of the twelve Field Orientation Probes (FOPS). Each probe samples a 3 arc-second diameter view with 7 segments. A minimum of 3 probes are required to be placed on stars ( $V < 15$ ) in the target field for minimal Alt-Az and Rotational guiding. Guide rates of about .5 to 1 Hz are sufficient for good Alt-Az guiding. This guider also corrects for field rotation errors and is used to achieve best rotational alignment when first acquiring the target field. Rotational guiding is carried out at a rate of about .1 to .2 Hz. Some fine tuning of the algorithms could improve guiding performance, but current performance appears to be adequate.

