

4-m f/15 Guider and Acquisition Lens Installation

1. Introduction

The f/15 secondary at the 4-m telescope has been historically used for IR instrumentation because of its lower background and the fact that earlier IR instrumentation was designed for f/15 to simplify the optical design. As of January 2013, the only remaining instrument using the f/15 focus is Phoenix (both NEWFIRM and FLAMINGOS are f/8 instruments).

When SQUIID was built in 1989, it was necessary to design the focal plane within the instrument, well behind the nominal f/8 focal position. Other IR instruments were adjusted to match that focal position by the use of interface spacers; in the case of Phoenix, the Interface Unit not only positions the focal plane correctly, but contains the calibration sources.

Since the axial locations of the Acquisition TV and guide probe are only slightly adjustable and the nominal f/15 focus falls well behind them (about 320 mm), they can be used only by refocusing the f/15 beam using a 600 mm FL lens mounted in a fixture on the guide probe, approximately 300 mm in front of the ICCD camera. A similar lens is used on the Acquisition TV.

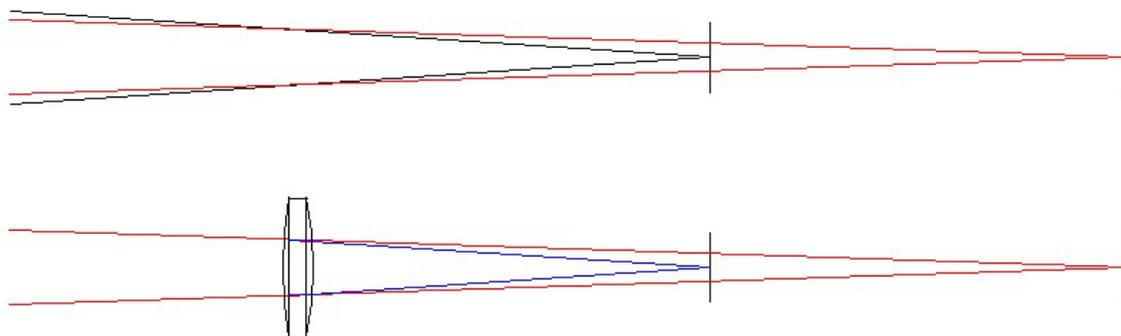


Figure 1: (top) Diagram of the nominal f/8 (black) and f/15 (red) focal positions. The f/15 focus is about 320 mm behind the f/8 position. (bottom) Inserting a positive lens displaces the f/15 focus back to the f/8 position (blue).

2. Lenses

The lenses for the Acquisition TV and guider are kept in separate wood boxes in the darkroom (Figure 2). The guider lenses are installed in aluminum holders, with the focal length marked on the side; you must use the 600 mm lens for Phoenix. The lens assembly for the Acquisition TV requires that separate lenses be installed to change the focal length. *Since Phoenix is now the only IR instrument using f/15, the 600 mm lens should be permanently installed.*



Figure 2: The boxes for the Acquisition TV (left) and guider (right) lenses

2.1 Acquisition TV

After verifying that the 600 mm lens is installed in the TV lens assembly (it is marked on the barrel), install it on the front of the North Port ICCD. The back of the TV lens has a C-mount which screws directly into the ICCD housing. The TV must be backed out significantly to permit the lens to be installed (Figure 3). *Lock the stage down while installing the lens, since the stage is well back.* After installation, slide the TV in so that about 4 inches of the lens assembly are outside the foam baffle; peaking up the position will be done on the sky.



Figure 3: The TV lens assembly after installation. Slide the foam light baffle over the tube.

2.2 Guider Lens

The guider lens is installed in a holder on the guide probe assembly about 100 mm in front of the 45 degree mirror (Figure 4). The lens mount has partial threads which constitute a bayonet mount that holds the lens in the holder.

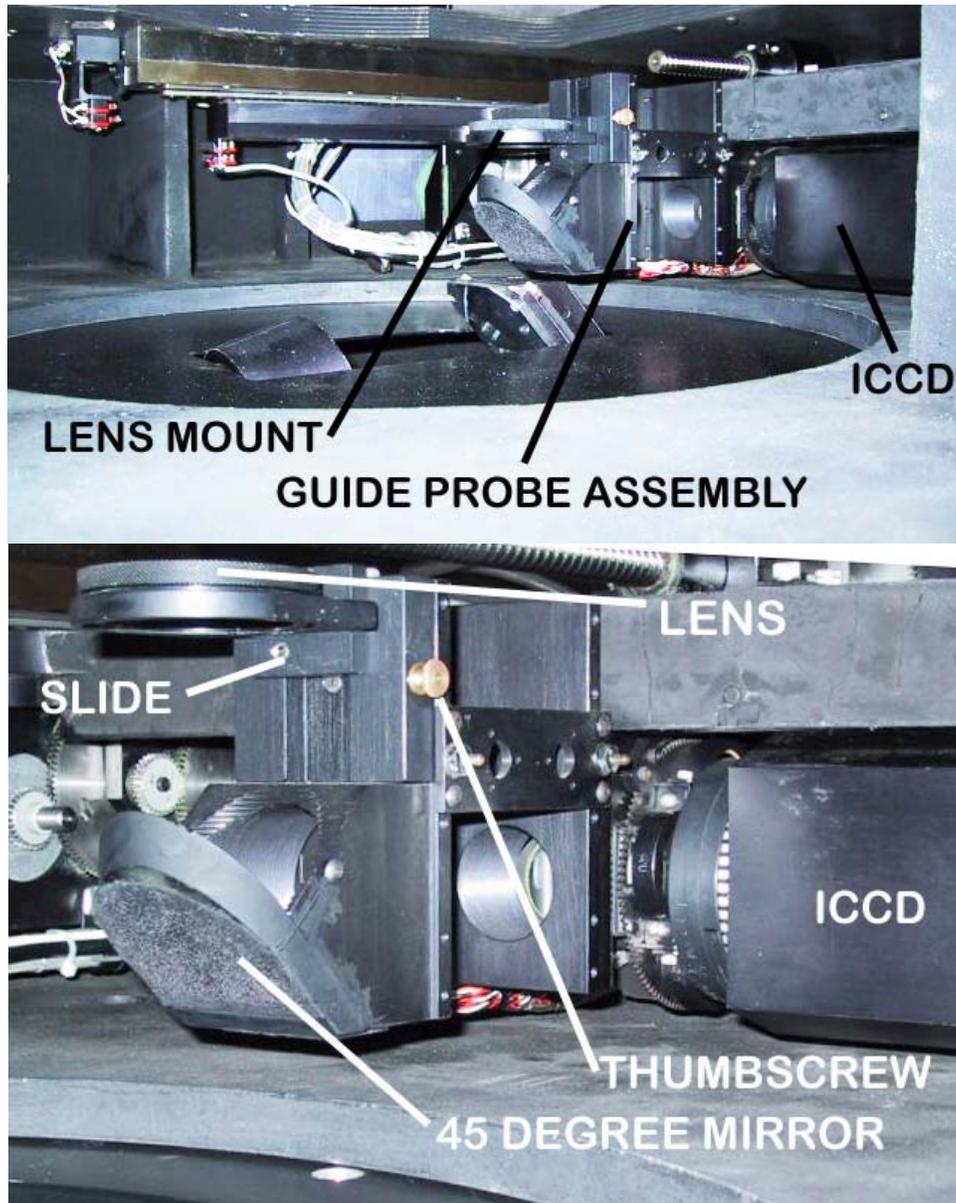


Figure 4: (top) Viewer of the inside of the guider, showing the guide probe assembly. (bottom) Closeup of the guide probe assembly, showing the lens mounted in the holder and the thumbscrew which can be used to adjust the axial location of the lens.

1. Manually move the S guide probe all the way to the east.

2. Remove the two small access ports on the E side of the guider, held on by Dzus fasteners. One may be able to access the probe through the port just under the calibration unit. If necessary, another person can illuminate the probe assembly through the other port.
3. If necessary, loosen the thumbscrew and move the slide until the end of the slide is **TBD** above the position of the thumbscrew (hopefully this will not need adjustment, if Phoenix remains the only instrument using the lens).
4. Holding the lens carefully, position it over the mount and rotate until it drops into place. Then rotate gently until it is locked in position.
5. Replace the two access port covers.

3. Removal

Removal is the reverse of the above procedures. Be sure to store the Acquisition TV lens assembly and the guider lens in their appropriate boxes and replace in the darkroom.