John Canfield **January 13, 1999**

NIRSPEC Cryomechanics Application Note 02.00
Procedure for Closing Vacuum Enclosure

Note-Parts of this procedure will have to be perfected at the telescope as UCLA does not have the facilities to simulate the telescope crane.

C Attach Crane to Hoist Points

Lower crane with spreader bar (UCLA provided) attached until the bottom surface of the bar is approximately one foot above the stored vacuum cover. Attach shackles at both ends of the spreader bar to the lift bars. (See Figure 1)

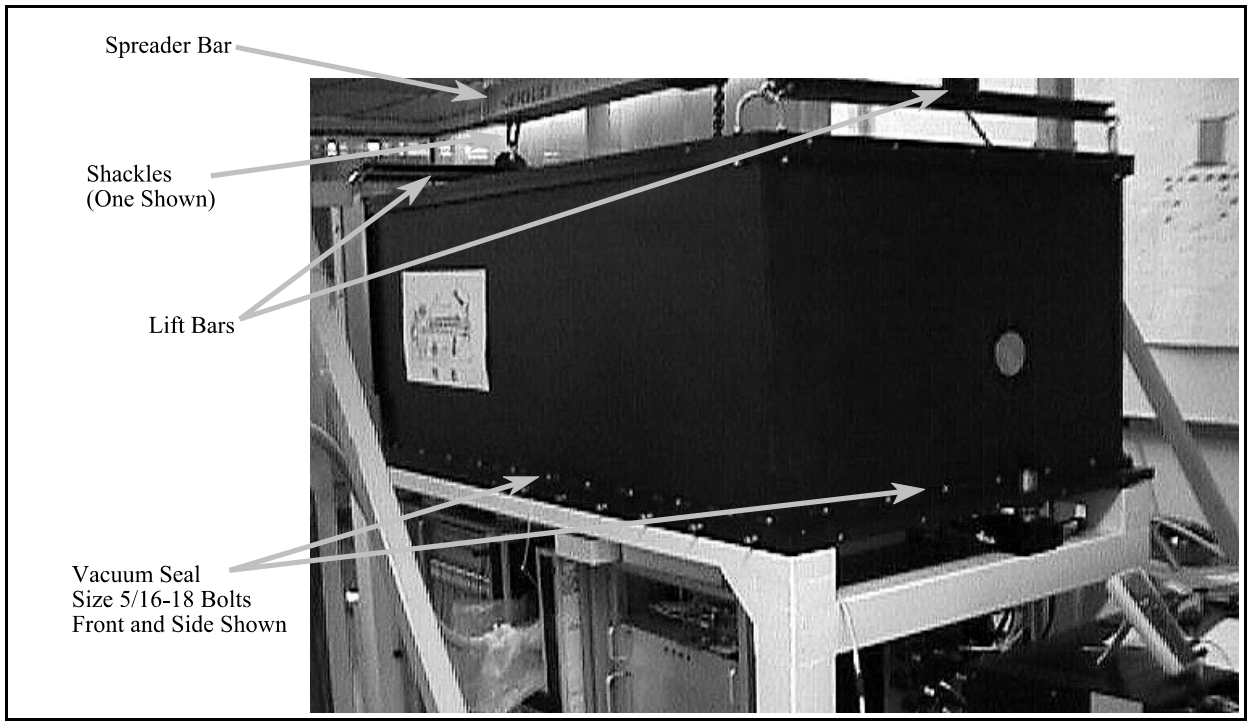

Figure 1; General Hoist Configuration

C Lift Cover and Cold Shield for Installation

This assumes cold shield was removed with the vacuum cover when the instrument was opened. If shield was removed by hand the vacuum cover is lifted independently and shield installation is covered in next section.

Slowly (1"/s or slower) raise the cover until it's bottom surface is approximately an inch above the internal cold shield. Attach four shield hoist clips to the bottom four corners of the vacuum cover and the the top four corners of the cold shield. Continue raising until they are at a height that will clear the instrument. (See Figure. 3)

C Manual Shield Installation

If shield is installed by hand, vacuum cover should not be raised until instrument is ready to exit AO enclosure.

Lower the shield slowly. It is a tight fit so the shield needs to be manually guided (two people at opposing corners). The primary clearance issue is between the walls of the shield and the four A-frame supports holding the optical structure. The walls should drop **inboard** of these supports. Built in stops will halt the shield at the proper position. Install all bolts that secure the cold shield to the optical structure. (See Figure 2)

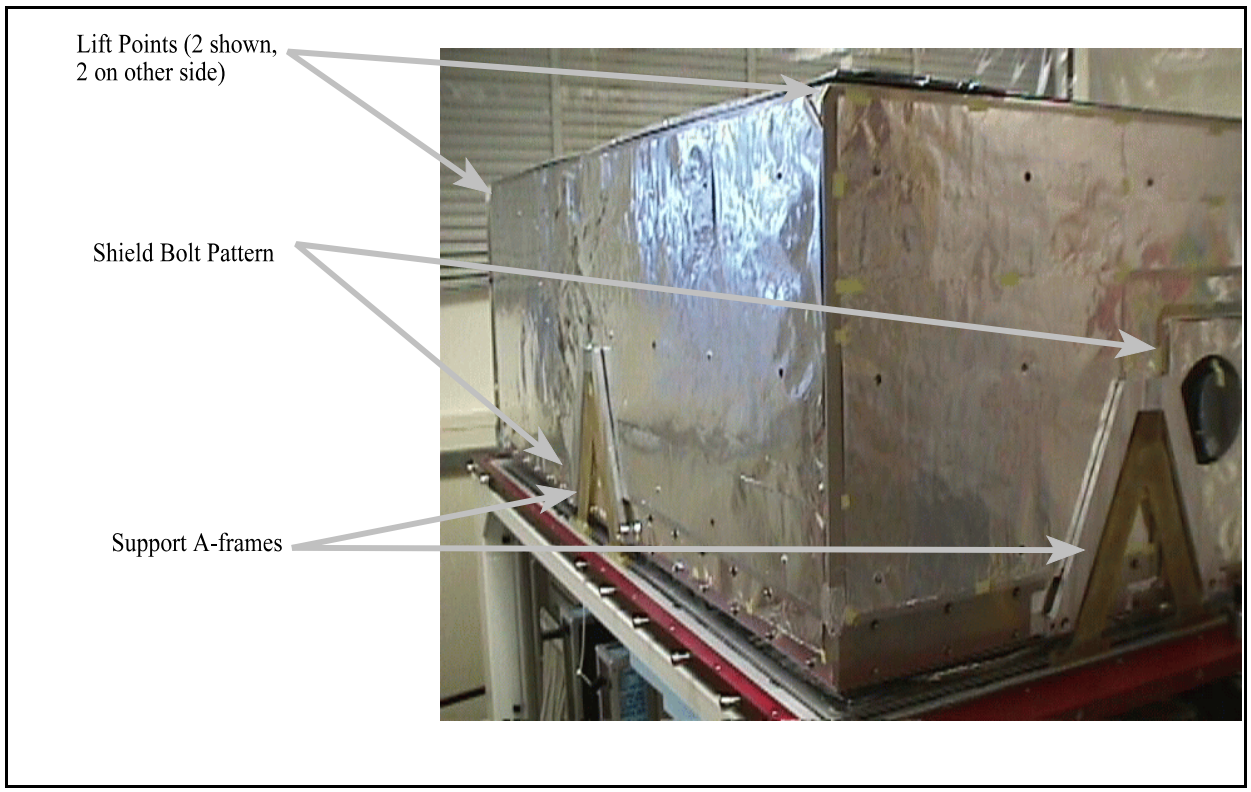

Figure 2; Cold Shield Detail

C Position Instrument

Move Nirspec underneath the raised vacuum cover. Lower the cover until it is within a couple of inches from the lift guides. Align Nirspec and cover relative to each other. (See Figure 3)

C Install Vacuum Cover

Lower the vacuum cover slowly (1"/s or less) onto the instrument. At least two people need to insure that it drops evenly. Some manual guidance maybe required. When the cover is very close to the lower plate (approximately 1/4") Partially install a few bolts in the sealing bolt pattern to help align the cover to the plate. Lower the cover the remaining distance. Tighten all bolts to finger tightness. Systematically (side to side, front to back) tighten the bolts. (See Figures 1 and 3)

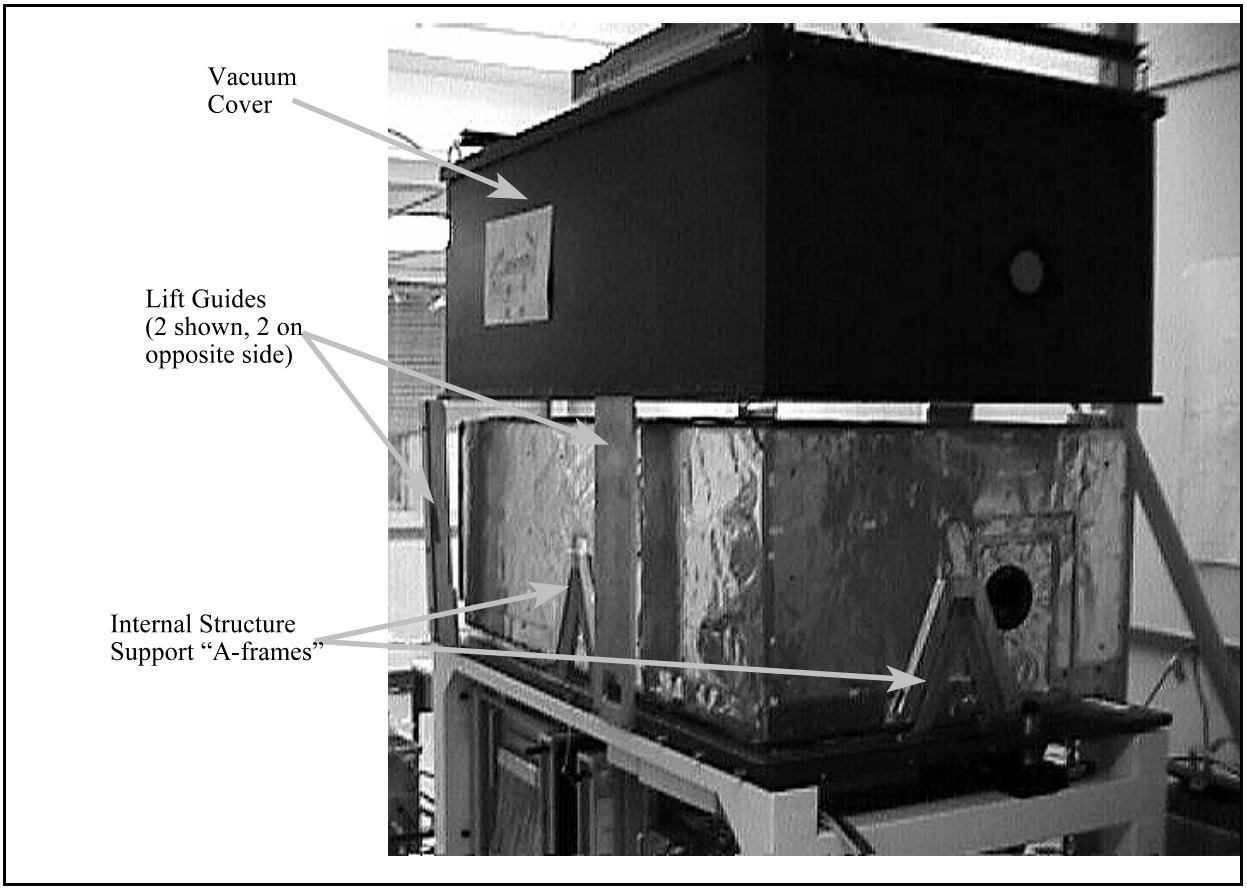

Figure 3; Raising/Lowering Cover

C Disengage Crane

Slacken hoist and undo shackles on spreader bar. Raise crane away from instrument.