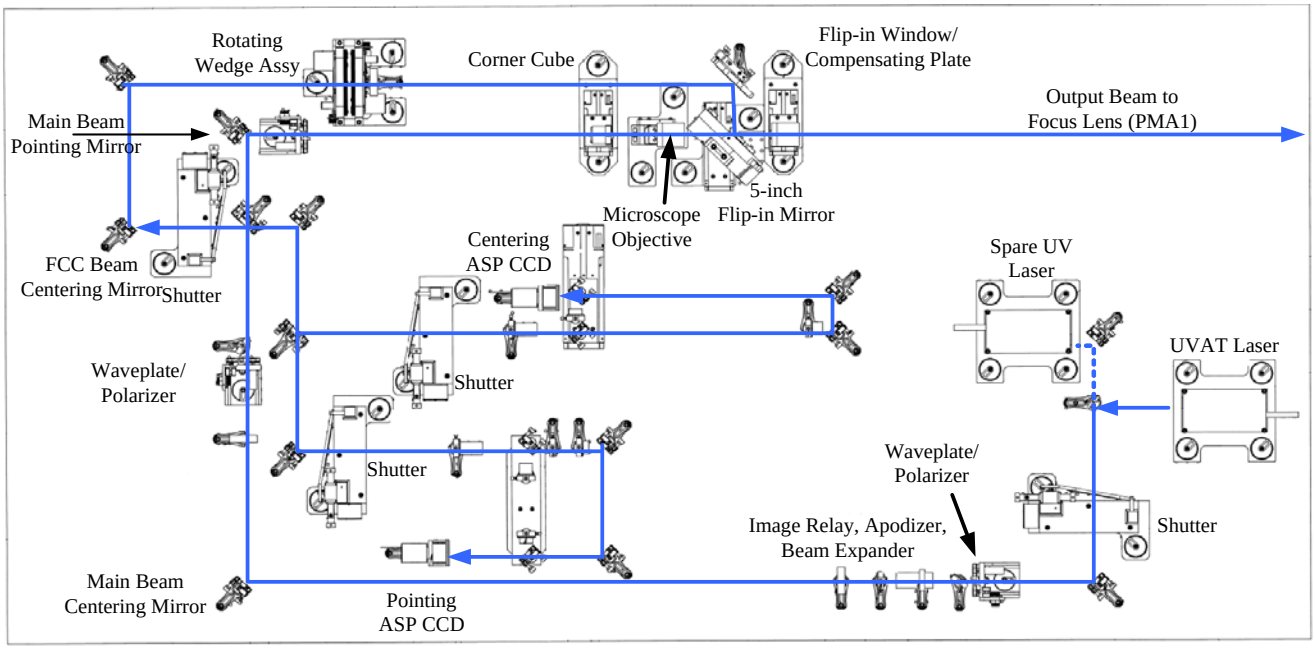
UVAT Maintenance Alignment Check
S-AB-P-193 Rev A

Intent: This procedure aligns the UVAT. Upon completion, the UVAT corner cube and the PMA1 selection mirror reflections will fall exactly on the established camera references, energy will be centered in the output beam, the hard aperture will be centered on the beam and the beam will be centered and correctly pointed at the UVAT focus lens (PMA1). The procedure is performed from within the Bay at the UVAT.

This is a Class 4 laser operating at 351nm and appropriate eye protection must be worn prior to performing either Startup Procedure listed below.



UV Alignment Table

Frequency: Quarterly

Personnel Required: 1

Procedure:

1	**UVAT Laser Start-up:** • Follow procedure S-AB-P-151 • Allow the laser to warm up for 30 min. before proceeding.	❑
2	Remove the shutters from the ASP cameras.	❑
3	**Check pointing and centering of the Main UVAT beam.** Insert the UVAT corner cube and the compensating plate. Ensure that the 5-inch flip-in mirror at the output of the UVAT is OUT of the beam path.	❑
4	Check pointing at the 'fine' pointing ASP by running ***centroid***. • Pointing should be aligned to the pointing references to within ± 1-pixel in both x and y directions. If it is not, adjust the UVAT Main beam pointing mirror.	❑
5	Remove the corner cube and rotate PMA1 to the retro location on the 'fine' pointing ASP. • Run ***centroid*** and adjust tip/tilt of the PMA1 mirror to retro the beam onto the 'fine' pointing ASP reference to within ± 1-pixel in both x and y directions.	❑
6	Attach the focus lens crosshair and observe the beam on the centering ASP. • The crosshair should be centered to the centering reference. If it is not, then perform the alignment procedure starting in step 12 below.	❑
7	**Check pointing of the FCC alignment beam.** Ensure that the Main UVAT beam is retro-reflected from PMA1 onto the fine pointing camera. • Run ***centroid*** and adjust tip/tilt of the PMA1 mirror to retro the Main UVAT beam onto the 'fine' pointing ASP reference to within ± 1-pixel in both x and y directions.	❑
8	Insert the 5-inch mirror at the output of the UVAT into the beam path and remove the compensating plate from the beam path.	❑
9	Rotate the rotating wedge assembly in the FCC alignment beam path to the "open" position (i.e.: no wedge in the beam).	❑

(continues)

10	Check pointing of the FCC alignment beam reflected from PMA1 at the 'fine' pointing ASP. • Pointing should be aligned to the pointing references to within ± 1-pixel in both x and y directions. If it is not, adjust the 5-inch mirror.	❑
11	Using a fluorescent card, ensure that the beam is centered at the focus lens crosshair. • If necessary, adjust the FCC centering mirror. • Iterate between centering and pointing adjustments.	❑
	(end of procedure)	

Complete Alignment (begins after step 6)

12	Use a fluorescent card to ensure that the beam is centered at each of the flip-up crosshairs on the UVAT.	❑
13	Insert the UV table's compensating plate at the output of the UVAT into the beam path. Ensure that the 5-inch flip-in mirror at the output of the UVAT is OUT of the beam path. (continues)	❑
14	Propagate the beam to the UVAT focus lens crosshair. Use a fluorescent card to check the overlap of the final flip-up crosshair to the focus lens crosshair. Note: Crosshair overlap may also be viewed by adjusting PMA1 to retro the beam to the UVAT ASP centering camera. • If necessary, adjust the Main beam centering and pointing mirrors to obtain crosshair-to-crosshair alignment while maintaining beam centration at the last flip-up crosshair. • Iterate between centering and pointing adjustments. Verify with a fluorescent card that the beam footprint is centered at the focus lens crosshair. If it is not, iterate again between pointing and centering adjustments.	❑
15	Remove the final flip-up crosshair from the beam path. Insert the UVAT corner cube into the beam path. • Check pointing at the 'fine' pointing ASP by running ***centroid***. Pointing should be aligned to the pointing reference location on the camera to within ± 1-pixel in both x and y directions. If it is not, adjust the mirrors in the pointing arm of the UVAT ASP. (continues)	❑

16	Remove the corner cube and rotate PMA1 to the retro location on the 'fine' pointing ASP. • Run ***centroid*** and adjust tip/tilt of the PMA1 mirror to retro the beam onto the 'fine' pointing ASP reference to within ± 1-pixel in both x and y directions.	❑
17	Observe the beam on the centering ASP. Place the focus lens crosshair onto the centering reference location on the camera by adjusting the mirrors in the centering arm of the ASP.	❑
18	Remove the focus lens crosshair and observe the energy centration in the centering image by running ***centroid.*** • If the energy peak is not centered at the centering reference location, adjust the centering mirror until it is. Pointing will have to be maintained by adjusting the pointing mirror. • Iterate between centering and pointing adjustments until the energy peak is at the centering reference location and the beam is pointed onto the pointing reference. • At the end of this procedure, the energy peak and the focus lens crosshair locations should coincide. Replace the focus lens crosshair and verify this. • Iterate between centering and pointing adjustments until the beam energy peak is within 10 pixels of the crosshair location when the crosshair is on the centering reference.	❑
19	Center the software reticule to the focus lens crosshair and set the reticule radius to just touch the edge of the beam. The beam should be centered within the reticule. If it is not, adjust the hard aperture until it is.	❑
20	Insert the UVAT corner cube into the beam path and ensure that the pointing spot is on the pointing reference location to within ± 1-pixel in both x and y directions. If it is not, then the PMA1 mirror may have drifted during the alignment procedure. Correct this as follows: • Adjust the Main beam pointing mirror to place the beam reflected from the corner cube onto the pointing reference. • Remove the corner cube and adjust PMA1 to place its reflection onto the pointing reference. • Some iteration between Main beam pointing and centering mirror adjustments will be required.	❑
21	Record the PM in the Beamlines log. (End)	❑

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Document Release:
This document is a component of Vol. X OMEGA EP Subsystem and Component Maintenance, Chapter 4, Beamlines, S-AB-P-019.

Approval for release of this document into the PDM system was granted by:

S. Loucks; Director, LLE Engineering Division
S. Morse; OMEGA EP Project Manager
M Guardalben, System Science
J. Edwards; OMEGA EP System Engineer
M. Moore; Beamlines Manager
N. Gasal; OMEGA EP Beamlines Engineer