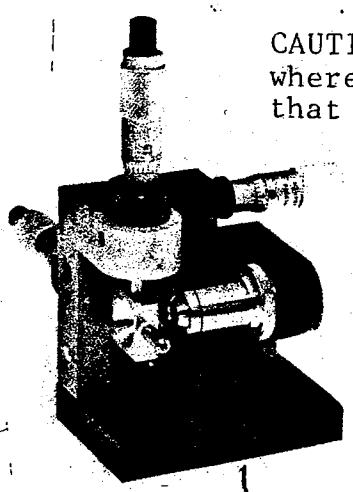
SPATIAL FILTER BEAMSPREADER

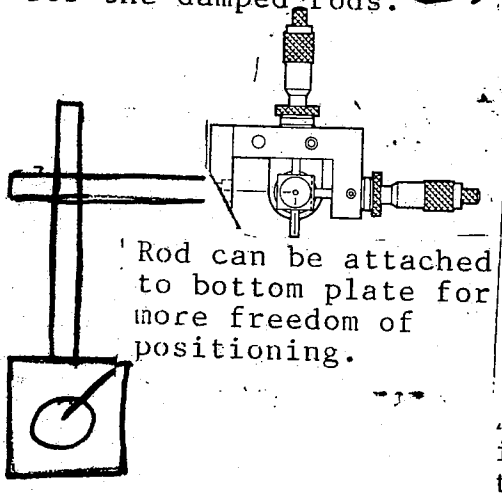


CAUTION!! This adjuster exhibits "Lefty's Revenge", wherein the movement of the objective is contrary to that established by the right hand rule of thumb!

Fits on special carriage for the damped rods.

Alignment

Aligning Model 900 is straightforward. Position the spatial filter assembly in the laser beam while observing back reflections from the microscope objective to bring them into best coincidence with the input laser beam. Next, align the pinhole: (1) defocus the lens; (2) while observing the pinhole substrate, adjust the pinhole position until a faint light appears at the output; (3) alternate the lens Z-axis adjustment with pinhole position corrections until the best throughput and focus are achieved. This is indicated when a deliberate pinhole shift causes the symmetric output pattern to disappear. A slow smear means a poor focus.



Rod can be attached to bottom plate for more freedom of positioning.

Pinhole/Objective Selection Guide

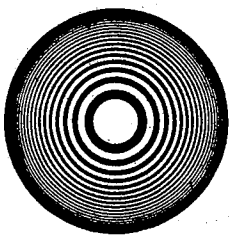
Objective	Recommended Max. Input Beam Diameter (mm)	Calc. Pinhole Dia.* (micron)	Recommended Pinhole Dia. (micron)
M-5X	5	32.3	50
M-10X	5.5	18.7	25
M-20X	5	10.5	15
M-40X	4	5.4	10
M-60X	3.5	3.7	5

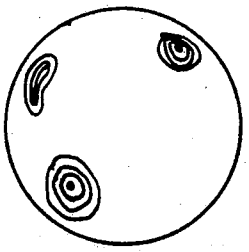
*For 1 mm Diameter Beam at 633 nm; see Optics Tutorial

Although these are recommended, they are just starting points. You may have to try different pinholes to get the best tune.

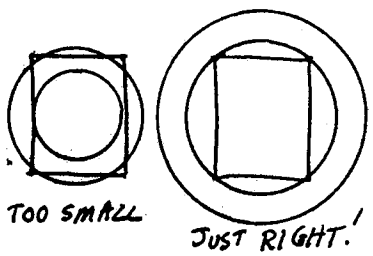
Pinhole too small: will never get rid of rings.

Pinhole too big: some noise will squeak through.





CHOICE OF OBJECTIVE: Whichever one fills the entire plate or object with the hot center of the Gaussian beam profile. The higher the "X number" the wider or faster the spread. Inserting a weak diverging lens (-20 to -40 focal length) before the objective allows you to zoom the spread.



EW 1/29/89

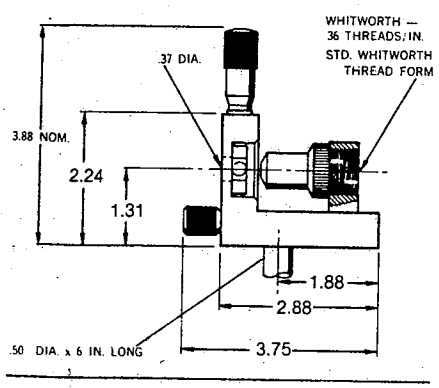
Lens Pinhole Spatial Filter: LPSF-100

The LPSF-100 spatial filter is a compact, versatile instrument designed especially for holography and optical data processing.

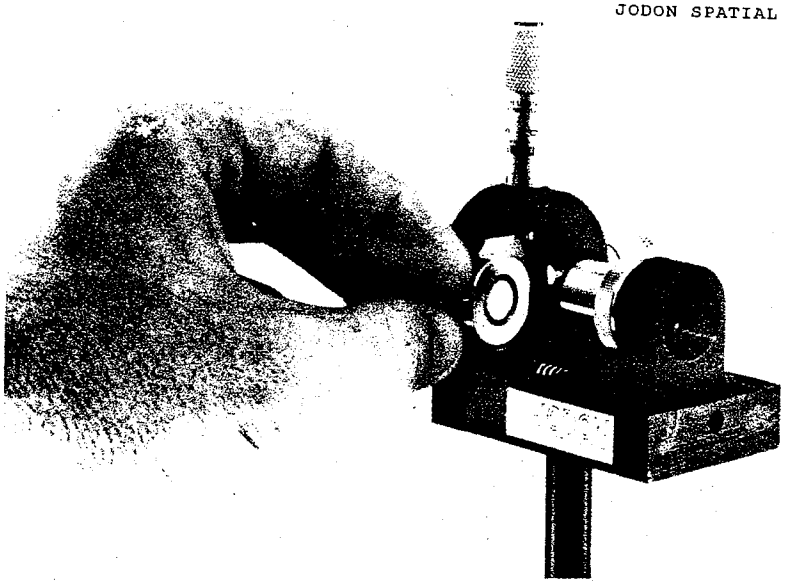
The instrument consists of a pinhole movable along with X and Y axes and a standard microscope objective movable along the Z axis. The pinhole is made of electroformed nickel mounted in a 0.875-inch diameter ring magnet. Precision micrometer screws glide the magnet on a Teflon® pad along the X and Y axes. Smooth movement along all three axes leaves no detachable lash or sideplay. Also, the sensitivity of the mechanism enables you to use pinholes as small as 5 microns and microscope objectives as large as 60X.

The easily removable, magnetic-pinhole assembly characterizes the versatility of the instrument. This removable assembly enables you to arrange the subject and reference beams of a holographic system, or the optical axis of an optical data processing system, before you insert and adjust the pinhole. You can also quickly change the pinhole size to produce the required degree of filtering simply by sliding a different pinhole into place.

Set-up time, from total nonalignment to alignment, is typically less than 2 minutes. After you align the filter, you can remove and reinstall any magnetic-pinhole unit without adjusting the axis controls.



Teflon® is a registered trademark of E I Dupont de Nemours and Co Inc



The Jodon Lens Pinhole Spatial Filter Model LPSF-100 has a major improvement over the Newport Model 900 Spatial Filter in the pinhole holding department. Instead of limply holding the Pinhole Mount with weakly magnetized Micrometer Knobs, the mount of the Jodon is itself magnetic, and slides on a Teflon-coated steel washer.

The problem with the stock Jodon is that the Objective may be screwed in too close to the Pinhole Foil during the heat of alignment and crush it in a vice-like grip*. We have modified the unit by reversing the Pinhole Positioning Plate so that when the Objective contacts the Pinhole it will push it out and not pinch it.

CAUTION! Some Pinhole Mounts may not have any handles! Orient the Mount with the round side down, with the Pinhole Foil towards the Microscope Objective.

TO TUNE: Look back toward the Pinhole, off its axis, and alternately manipulate the Horizontal and Vertical Control Knobs until maximum brightness is obtained. Pick a direction to turn the Microscope Objective Focussing Knob on the front of the unit, and work the Pinhole Knobs again. If the spot is brighter, continue turning the Focus in the same direction until there is enough light leaking through to be seen on a card. Otherwise reverse direction to get to the desired effect.

Currently these units run for $725. They could save us some money by not rounding all the corners for styling, because big square blocks, which the round ones were machined out of, block much more stray light.

*** As opposed to the Newports, whose Pinholes drop to the table top when the Microscope Objective contacts the Mount.**