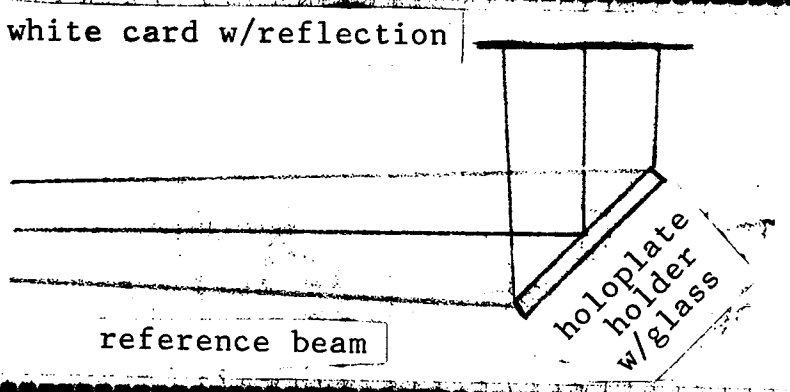
ALIGNING POLARIZATION VECTORS

Most lasers are polarized. Proper alignment of the plane of polarization will increase throughput of light through glass plates and minimize the dreaded woodgrain!

Cylindrical laser heads can simply be rotated to find the proper plane of polarization. Lasers which have a permanent orientation require the magic of half-wave retardation plates to spin their vectors.

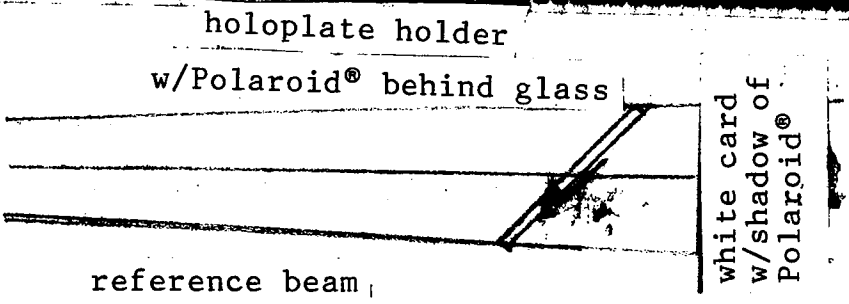
For single beam work, a half-wave plate positioned before the spatial filter is all that's necessary. When splitting the beams with a rotary or mirror type beamsplitter a half-wave plate positioned before the beamsplitter is all that's necessary again; but rotating the half-wave plate may change the beam balance ratio because the reflected beam may get stronger or weaker depending on the orientation of the beam going into the splitter.

But since the beams coming out of polarizing beamsplitting cubes are polarized at right angles to each other a half-wave plate may be necessary in one beam or the other or both! Check both beams!

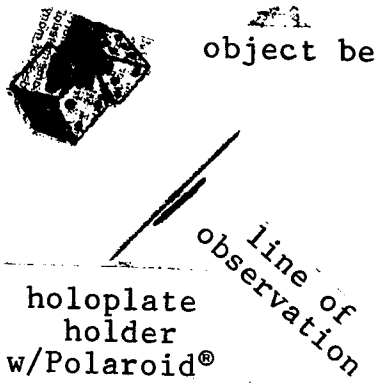


STEP I: Observe the reflection of the reference beamfrom a piece of glass in the plateholder on a white card. Rotate the polarization until this reflection is minimized.

STOP!! DONE FOR SINGLE BEAM WORK!



STEP II: Determine orientation of plane of polarization by minimizing the shadow of a Polaroid filter (rotate the filter) placed in contact with the glass plate placed in the plate holder.



STEP III: Rotate the polarization of the object beam to match the reference beam. Look through the Polaroid at the object and rotate the polarization of its beam so that the throughput is minimized. PROBLEM - Some objects do such a good job of randomizing the polarization that there is no best orientation of the half-wave plate.

BOTH BEAMS MUST HAVE THE SAME POLARIZATION VECTOR ALIGNMENT TO INTERFERE!!!