

A versatile beam splitter for holographers

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In optical holography it is necessary to produce two beams of the same wavelength and having approximately equal path lengths from laser to film. One of the most annoying tasks in setting up is adjusting the intensity of the reference and object beams. The beam splitter to be described makes this a quick and easy job.

Using two front surface mirrors joined at an angle, the incident beam can be split and the two resultant intensities varied to obtain any desired reference to object beam ratio. The laser beam is incident on mirror *A* as indicated in Fig. 1; this mirror is adjusted until the beam is incident on the edge of mirror *B*. Part of the beam continues undisturbed while part is reflected from mirror *B*. Lateral movement of the beam splitter assembly will obviously determine what percentage of the incident beam is reflected and what percentage continues undisturbed. After altering the beam ratio, no adjustment will be necessary in the optical elements directing the undeviated beam; minor adjustments may be needed in the optical elements directing the reflected beam.

Finally, the mirror edge *E* that actually does the splitting should be cleanly cut, or better yet, not cut at all. A jagged edge will produce a halo effect with resulting undesirable images.

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Editor's note: A more expensive but easier to adjust beam splitting system could be made with the Edmund variable density beam splitter No. 41 960 at \$26.50. The

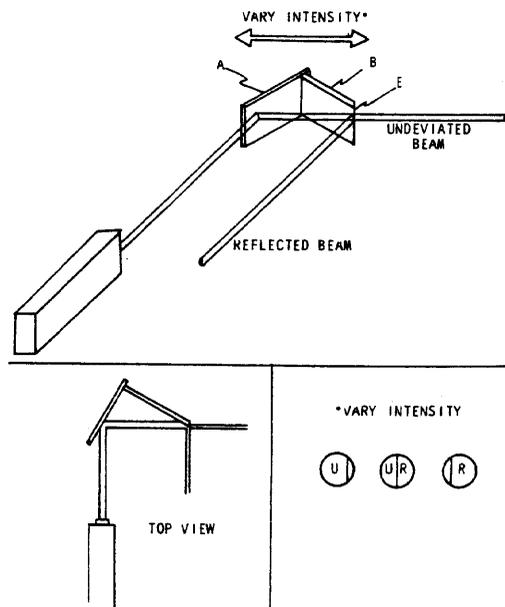


Fig. 1. Beam splitter assembly (*AB*), mirror edge (*E*), reflected beam, and undeviated beam. The double-headed arrow indicates the motion of the assembly needed to vary the intensities of the two beams.

Edmund model consists of a variable density film of Inconel on a clear 1 × 3-in. glass plate. The density changes from 0.02 to 2.00 in a distance of several inches, allowing one to vary the beam ratio accordingly.