Place the laser at the back of the lecture room, darken the room completely, and project diffraction patterns on the screen at the front of the room. (See WARNING.) Place the slide holder (A) in the fitting farthest from the laser, in which position the laser beam passes through the slide above the center. A flashlight is provided to facilitate working in the darkened room.

Double Slit vs Single Slit of Width Roughly Equal to Separation of Double Slit: Slide F contains two double slits of different separations \( d \), above two single slits of different widths \( w \). For each vertical component, \( w = d \) roughly. Place this slide in the holder, with the double slits at the top, and carefully adjust its position until one of the double slits is centered in the beam. Observe both the nature and the spread of the double slit pattern. Now raise the slide holder, readjusting slightly if necessary the horizontal position of the slide, until the single slit is in the beam. Compare the nature and spread of single slit pattern with that of the double slit pattern. (See Note.) You may or may not wish to repeat the demonstration using the second vertical combination of double and single slits on the same slide.

Double Slit vs Single Slit Formed by Covering One Opening: Slide G contains two double slits of different separations \( d \), above two single slits of different widths \( w \), the single slits being extensions of one of the pair of openings forming each double slit. For the narrower pair \( d/w = 3.3 \); for the wider pair \( d/w = 4.5 \). Place this slide in the holder, with the double slits at the top, and carefully adjust its position until one of the double slits is centered in the beam. Observe the double slit pattern, including the intensity modulation which is particularly obvious for the wider pair. Now raise the slide holder until the single slit is in the beam, and observe the single slit pattern. (See Note.) This pattern is exactly that which would have resulted if one opening of the double slit had been covered. Note that a number of the double slit bright fringes occur within the central bright fringe of the single slit. It is obvious, particularly from the wider slit pattern, that the intensity modulation in the double slit pattern is caused by the single slit pattern. You may or may not wish to repeat the demonstration using the second vertical combination of double and single slits on the same slide.

Note: If you prefer, the change from double slit to single slit pattern can be accomplished by inverting the slide instead of raising the slide holder.

WARNING: Never allow the direct beam from the laser to enter the eye. Warn students that they should not look into the beam.