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We propose to use a semiconductor laser to produce an expanded parallel beam illuminating a circular aperture (pinhole) attached to the detector. The light passing through the pinhole falls on a small CCD camera with the lens removed. Four sets of such an apparatus are envisioned, which will overdetermine the position and orientation of the detector in the x-y plane. The detector position in z can be fixed by a stop on the track in the solenoid, or by a variation of the technique proposed here.

1 Apparatus

The lasers are mounted on the downstream endplug of the magnet yoke. They will then move with the endplug when the detector package is withdrawn from the solenoid.

Two pinholes are mounted on the upstream, two on the downstream G10 endplates of detector stack. The CCD cameras are attached to the upstream endplug of the yoke

1.1 Layout of detector and alignment system

Shown below are two figures. The first Figure shows the layout of the G10 endplates of the detector, with four possible locations for the pinholes at the ends of the four protruding "arms".The second depicts the layout of the E614 experiment with one laser-pinhole-CCD camera set of alignment tools.

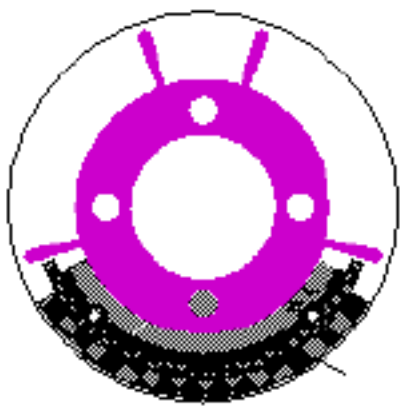

Figure 1: G10 End-plate.