Compensators are commonly used in photon beam therapy to correct for surface contour variations and tissue heterogeneities of the patient. In conjunction with wedges and collimator rotations, compensators may also be used to achieve dose uniformity for a multi-beam plan with the use of Sherouse's "Gradient Vector" technique [Sherouse 1993]. In this technique, local dose gradients within the isocenter are minimized through geometric analysis of the beam; gantry, table, and collimator angles, ssd, field size, etc,.

In this project, we have developed a technique to design and construct a single intensity modulation filter using gradient minimization. In so doing, we have eliminated the need for wedges and collimator rotations in delivering these optimized plans. Dose homogeneity within the PTV of less than 5% is achieved for both calculated and measured distributions when using this technique. An additional advantage of this technique is that it is easily implemented for complex, non-coplanar treatments.