beam entering the counter is restricted by the anvils, whose axes are not in the plane of Fig. 7, between which the gasket is formed. The thickness of this gasket can be seen in Fig. 8 in the region labeled B. Region B is symmetrically equivalent to the region labeled A where the X-rays actually pass, but shows the gasket in cross section. The carriage moves along the high-precision circular track in order to scan the 2θ angles characteristic of X-ray diffraction. The diffracted X-ray signal is inherently small due to the absorption and small solid angle. To improve the detectability, the background count is reduced by use of a pulse height selector in the electronic system.

As can be seen in the photographs, three separate and distinct detection systems are utilized, each with an independent counter, carriage, track, and electronic system. Each of the scanning tracks lies in a plane similar to the plane of Fig. 7. Each of these planes passes through the axis of the X-ray tube ram and the axis of one of the other three rams. The X-rays detected by each individual counter pass through the same sample but leave the tetrahedral sample chamber through a different gasket. Although X-rays are being scattered from the material of the pressure chamber all along the path of the direct beam, the detector slit system only views the small region around the sample, thus eliminating a large percentage of the spurious scattered X-rays. This slit system also requires the sample to be near the center of the tetrahedron as indicated in Fig. 8. The proper alignment of these slits, which is necessary to insure meaningful measurements, is one of the major problems of the X-ray geometry. This problem is enhanced since the tracks themselves are attached to the tie bars of the tetrahedral press and expand slightly as pressure is applied to the sample. Angular measurements of X-ray peak location as measured by the counter