The control program for the Enraf-Nonius CAD-4 diffractometer has been enhanced. Although the CAD-4 configuration used in this development (CAD-4 PLUS) is driven by routines that derive symmetry-constrained reflection parameters from the space group symbol. This routine is also available. The CREDUC cell-reduction program has been simplified and the routine is now available, including subsequent structure refinement. A reasonable model must be supplied by the user.

Main features of the extended software are as follows:
(1) input of the twin axes or plane is normally sufficient; alternatively the matrix may be fed in that describes the transformation between first and second twin individual;
(2) optional swap of the orienting matrices facilitates the change-over from one individual to the other;
(3) assignment to one of three categories (perfect coincidence, reflection splitting, sufficient peak separation) according to resolution in reciprocal space;
(4) one of the objectives is to achieve either horizontal or vertical peak separation in front of the detector, all procedures designed for a Eulerian cradle;
(5) for scans over pairs of twin reflections the coupling factor between $\omega$ and $\theta$ is computed individually;
(6) minimal or maximal separation of twin pairs in the equatorial plane of the instrument (K. Tichy, J. Bonef, Helv. Phys. Acta, 1977, 50, 459-466);
(7) control of reflection overlap in critical situations (cf. W. Denner et al., J. Appl. Cryst., 1977, 10, 177-179);
(8) check on intensity being cut off by the slits.

II.12 COMPUTER SIMULATION OF TWO-DIMENSIONAL INTENSITY DISTRIBUTIONS OBTAINED WITH CRYSTAL-MONOCROMATED X-RADIATION AND A SMALL SPECIMEN CRYSTAL By A.W. Stevenson
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Two-dimensional ($m, d$) intensity distributions are calculated for the case of crystal-monochromated (pyrolytic graphite) X-radiation incident on a small specimen (5%). The calculations are based on ray-tracing and take into account the mosaic spread of the monochromator, depth of penetration into the monochromator, source emissivity distribution, wavelength distribution, broadening due to the detector aperture, and various aspects of the experimental arrangement involved. The calculations are compared with experimental results and reveal excellent agreement.

A full understanding of such intensity distributions can yield detailed information about the nature of the individual components present. The analysis can also provide details essential to carrying out conventional one-dimensional ($m$) profile measurements in a correct and consistent manner.