A highly accurate goniometer head for large single crystals was designed using the principle of two rotational axes (Denne, 1971). This device is better than any other classically designed goniometer of the same size, giving an accuracy of 0.1° without the need of a Nonius scale. It is mainly used in our laboratory for orienting large single crystals by means of the photographic method. Detailed drawings are given in Fig. 1 and the very simple calculations necessary for its adjustment are described below.

The goniometer consists of three round parts of 58 mm diameter. Two parts have a wedge-shaped cross section inclined 9°, while the third part is flat (see Fig. 1a). Part C is the rigid component and can be attached to any stationary apparatus by the thread hole T. It should be mounted so that its base stands perpendicular to the incident X-ray beam. Parts A and B rotate and are held together and to part C by retention grooves and locking screws. The crystal holder is connected to part A by the screw S. Part A has four fiducial marks 90° apart. The wide side of part B is engraved on both edges in 2° divisions from zero to 180°. Part C has two fiducial marks 180° apart. The engraving positions are shown in Fig. 1b. The angular range of this device is ±18°.

The calculations for the adjustment of the moving parts for a film-to-crystal distance of 30 mm are described with the aid of the stereogram in Fig. 2. Point O is the center of the photographic film to which the required Laue point L should be brought. Circle M is the locus of rotation at 9° from point M.

In order to orient the crystal, point L is brought to point E, located on the lower half of the circumference of the circle M, by rotating part A. It is then brought from E to O by rotating part B. The angle of rotation of part A, angle LOE, contains the angle LOV, which is measured directly on the film, and the angle VOE, which is calculated by means of the formula:

$$\text{angle VOE} = \text{arc} \sin \left( \frac{LO}{MO} \right).$$

The LO distance should be measured directly on the film in millimeters (not with the Greninger chart). Its maximum value can be 21.8 mm which is equivalent to an 18° deviation from the center of the film. The length of MO is 10.9 mm and it is equivalent to a 9° deviation. A useful graph showing the values of angle VOE as a function of the length of LO is given in Fig. 3. From geometrical relations in Fig. 2 it is evident that angle VOE is half of the angle EMO and, therefore, the angle of rotation of part B should be twice the angle VOE.

It seems to us that the geometrical configuration of this device is the most versatile one for practical use. However, the accuracy could be further improved by decreasing the angular range by several degrees.

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**Reference**

**Crystallographers**


This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England).

Dr K. Aurivillius died on 22 March 1982. She was well known for her extensive X-ray and neutron diffraction studies of the crystal chemistry of mercury compounds, which brought her a position as docent at the University of Stockholm in 1965. Later she moved to the University of Lund to become a lecturer in organic chemistry. In spite of poor health over many years she was able to continue her research, together with many students, particularly on organo-metallic complexes.

Professor G. Lundgren suddenly died on 19 March 1982. He received his doctor's degree and became docent in inorganic chemistry. His thesis described research on the crystal structures of some basic salts, conducted at the University and the Royal Institute of Technology in Stockholm. In 1963 he became Professor of Inorganic Chemistry at the University of Gothenburg, where he built up strong research groups in crystallography and materials research. Since 1972 he was Rector Magnificus of the University. His extraordinary capability as an organizer and administrator was extensively used in Swedish and international scientific organizations.

Dr Lester W. Strock died on 21 March 1982. He was a familiar figure at meetings of the American Crystallographic Association and its predecessor societies from their inception until he retired. He made many contributions to crystal chemistry, including solution of the z silver iodide structure.