part that holds the line-up slit was recessed by \( \frac{3}{4} \) of an inch away from the tube. This was necessary because the Philips tube has a larger head than that of the Picker.

The second part prepared was a square block made out of aluminum with a side \( \frac{1}{2} \) inches long and a middle hole of \( \varphi = 110 \) mm parallel to its length. This block was screwed to the end of the tube holder. This made the holder long enough to be supported at its end by the diffractometer.

Apart from the two new parts a few changes had to be made in the tube holder. First the elongated aperture of the Picker tube together with its base was screwed onto one of the line focus apertures of the tube holder. For this purpose the tube holder had to be machined flat, around the X-ray window. The Philips lead-metal window shutter, which is used to open the aperture and let the X-rays out, remained intact.

The translation device of the diffractometer was then also screwed onto the new tube holder after machining flat one of the spot focus sides of the tube holder.

The take-off angle cradle was also attached to the new tube holder by machining flat the appropriate place on the holder, and screwing the cradle on to the holder.

The window-shutter relays of the tube holder were wound up anew in order to adapt them to the voltage that the Picker generator provides for them.

The high tension cable of the Philips tube has an end fitting which fits the Picker generator and can be used directly. In this case the voltage and current meters do not show the voltage and current on the tube exactly, but the difference is small and the meters can be easily recalibrated.

After the tube was put on the diffractometer, the alignment of the latter was carried out step by step as usual. This included the tangential and radial alignment of the tube, so that the focal spot coincided with the axis of rotation of the tube and would not move out of coincidence when the take-off angle was changed.

In our case a fine focus Cu tube was used, and after the alignment it gave very good diffraction spectra of a Si-standard and Novacolite specimens. The tube that we used was of the long anode type, and so an adaptation spacer had to be used. This gave a maximum of possible scanning of about \( 2\theta = 150^\circ \). Without the spacer this maximum should go up to about \( 160^\circ \). The new Philips tube holder is even shorter and with it a maximum of \( 2\theta \approx 170^\circ \) should be attainable. This new tube holder also permits the use of 2 kW high intensity tubes, which can be very useful when relative low diffraction line intensities are to be recorded.

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(Received 16 July 1969)

Flat film Weissenberg attachment for the Polaroid XR-7 cassette

The use of the Polaroid XR-7 cassette with precession cameras has become widespread and popular for obvious reasons. A corresponding degree of convenience and speed seems desirable when Weissenberg techniques are employed. A solution to this problem, utilizing the XR-7 cassette, is outlined in this communication.

The regular cylindrical film cassette on the Stoe Weissenberg goniometer rests on a carriage which is easily removed \( \text{via} \) a dovetail track mounting. An adapter, sketched in Fig.1, was constructed to fit the existing track. The adapter was made of aluminum, with the bottom and back parts machined separately and then joined with two screws. Owing to the size of the XR-7 cassette the crystal-to-film distance cannot be made less than about 4.4 cm. With this distance the \( 2\theta \) range from \(-50^\circ \) to \(+50^\circ \) can be recorded on the film.

To aid in the interpretation of the photographs the appearance of parallel reciprocal lattice rows on a zero layer photograph has been graphed (Fig.2), using equations given by Buerger (1962), with the modifications necessary for this particular geometry. For a translation of 0.5 mm degree\(^{-1}\) rotation the equation is

\[
y = r \tan [\omega + \arccos (\cos \omega + d)]
\]

where \( r \) is the crystal-to-film distance (4.4 cm in the present case); the other symbols have the meanings given by Buerger.

The attachment has been in use in this laboratory for about a year, and has proven its utility in preliminary studies of new compounds, in quality
checks of crystals intended for diffractometer intensity measurements, and as a means of obtaining quite good cell dimensions with a minimum of effort. The expression for the length of a reciprocal axis, $a_1^r$, determined from a flat-film zero-layer Weissenberg photograph is

$$a_1^r = 2 \sin \left( 0.5 \arctan \left( \frac{H}{r} \right) \right) / h_0$$

where $H$ is the vertical distance from the reflection of index $h_00$ to the direct beam trace. The length of the rotation axis, $(a_1)$ can be obtained from the expression

$$a_1 = h_0 \lambda (r^2 + H^2 + y^2)^{1/2} / y$$

where $y$ is the distance from the zero layer line to a given spot on layer line $h_1$, and $H$ is the vertical distance from this spot to the direct beam trace.

The author wishes to thank Mr W. Krimetz, who constructed the equipment. This work has been supported through a grant from the National Science Foundation.

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(Received 18 July 1969)

Reference