

“Stereo fiducial marks” of the ATLAS98 detector specification  
(Draft 98/4/23)  
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Motivation for the change:

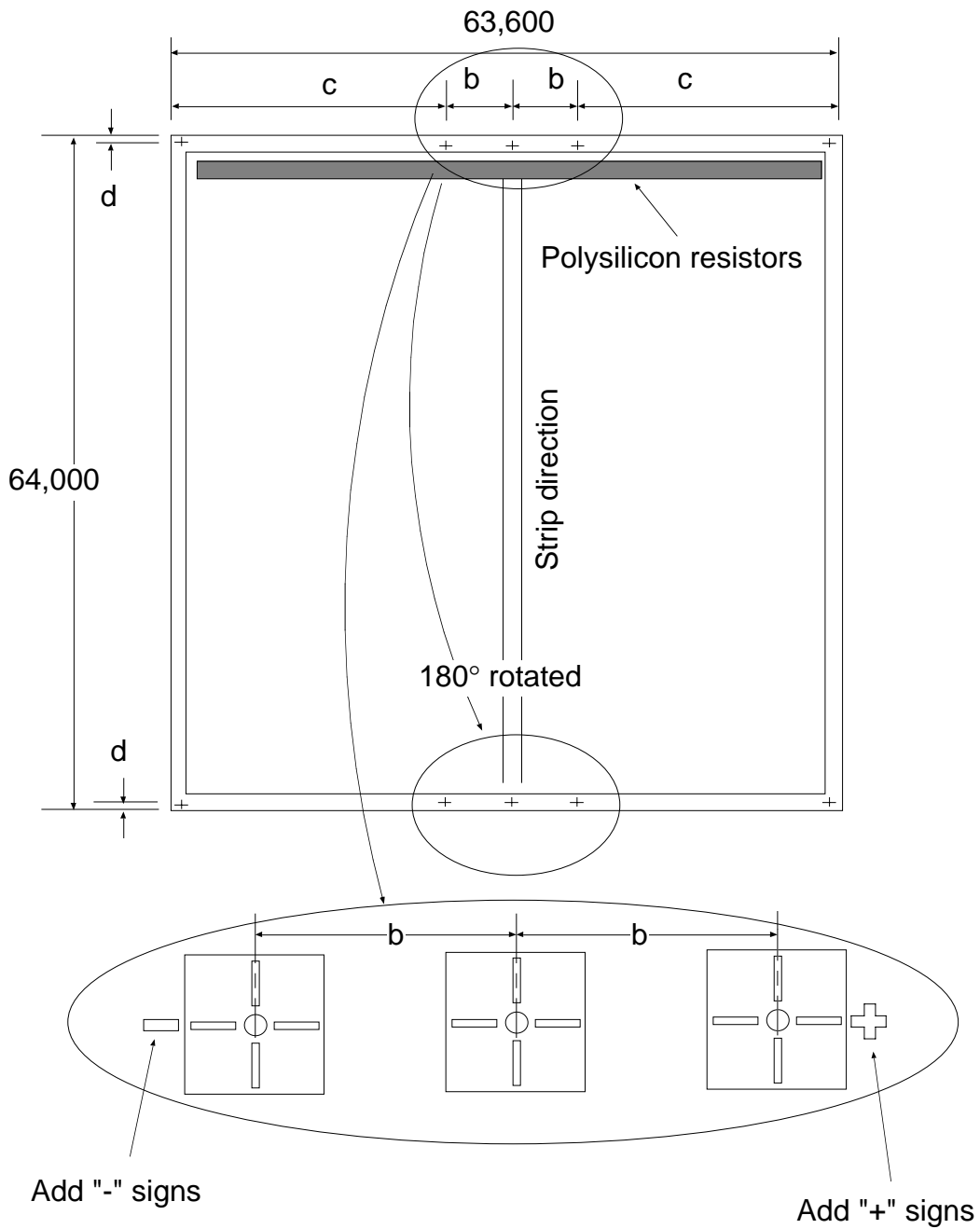
“Stereo fiducial marks” in the ATLAS98 silicon microstrip detector layout (Draft: 98/3/19, last update 98/4/13) are defined by taking the face value of 40 mrad. This was adequate when the detectors in one side of the module was always aligned to the longitudinal module axis. In the latest module design, e.g., the drawing “0059-070 series”, the detectors in the front and the back side are rotated +20 mrad and -20 mrad relative to the longitudinal module axis, respectively. The “stereo fiducial marks” are to help the alignment of the detectors in the step of the module assembly and the detectors are rotated to the axis of the module assembly jig which is most-likely the module axis.

Changes:

- 1) The distance between the centre mark and the side marks, “b”, will be changed by taking the half-stereo angle of 20 mrad. It will be 1275.17 microns (for the distance “d” of 250 microns).
- 2) Since the distance “a” of the draft 98/3/19 will be a mere 5 microns, the effectiveness of having the separation of the “double arms” in the centre mark is less prominent. Discard the “double arms” and have the same “single arm” of the side marks.
- 3) The “double arm” of the centre mark had another meaning of identifying the centre mark from the side marks. In order to make the centre mark distinctive from the side marks, discard the “+” and “-” marks along the centre mark.
- 4) In order to keep the orientation of the detector/mark, the side marks will keep the “+” and the “-” marks asymmetrically, such that the right-hand side mark has only the “+” mark in the right-hand-side of the right-hand side mark, and the left-hand side mark the “-” mark in the left-hand side of the left-hand side mark.

A new drawing of the stereo fiducial marks (Stereo fiducial 98) is appended in this note.

When this proposal is approved, the ATLAS98 layout note will be updated.



"Stereo fiducial marks" are to be located at the half-stereo angle of 20 mrad for 2 detectors being butted (i.e., 128 mm outer length)

$$b = (64,000 - d) \cdot \tan \theta \quad c = 31,800 - b$$

Example:  $d = 250$ , then,  $b = 1275.17$ ,  $c = 30524.83$  microns

Stereo Fiducial Marks 98

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