

PROPOSED AMERICAN STANDARD

Rectangular Holes in Twelve-Row Punched Cards*

Editor's Note

This Proposed American Standard has been accepted for final letter ballot and concurrent publication by a Subcommittee of the American Standards Association Sectional Committee X3, Computers and Information Processing. In order that the final version of the proposed standard reflect the largest public consensus, X3 has authorized publication of this document to elicit comment, criticism and general public reaction with the understanding that such a working document is an intermediate result in the standardization process and is subject to change, modification or withdrawal in part or in whole. Comments should be addressed to the X3 Secretary, Business Equipment Manufacturers Association, 235 East 42 Street, New York, N. Y. 10017.—E. Lohse, CACM Assistant Editor for Information Interchange.

1. Scope

This standard specifies the size and location of rectangular holes in twelve-row, $3\frac{1}{4}$ " wide punched cards. To be a processable document suitable for information interchange, cards must also meet ASA Standard (X3/34).

2. Detail Requirements (See Figure 1)

2.1 Size. All edges of the hole shall fall between two concentric rectangles whose edges are parallel to the X and Y datum lines. (See 2.2.1 and 2.2.2.) The rectangles are dimensioned as follows:

Outer Height: 0.126 inch, Length: 0.056 inch
Inner Height: 0.124 inch, Length: 0.054 inch.

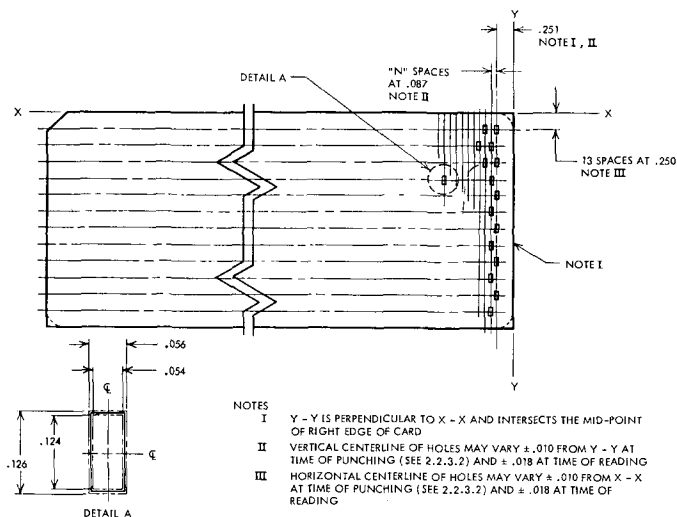


FIG. 1

2.2 Location. All holes shall nominally center on the intersection of longitudinal and transverse grid lines located as follows:

2.2.1 Twelve longitudinal grid lines (rows) shall be spaced at increments of 0.250 inch from the X datum line.

2.2.1.1 X Datum Line—a horizontal line lying along the top edge of the card.

2.2.2 Transverse grid lines (columns) shall be spaced at increments of .087 inch from a transverse grid line spaced at .251 inch from the Y datum line.

2.2.2.1 Y Datum Line—A vertical line exactly at right angles to the X datum line, and intersecting the mid-point of the right edge of the card.

* ASA Document X3.2/410, July 15, 1966

2.2.3 Tolerance on Hole Location

2.2.3.1 Reading Tolerance. The centerlines of each hole shall be within 0.018 inch of their corresponding longitudinal and transverse grid lines at the time of reading.

2.2.3.2 Punching Tolerance. Because changes in environment affect the dimensions of paper cards (see Appendix), the center lines of each hole should be within 0.010 inch of their corresponding longitudinal and transverse grid lines at the time of punching.

2.3 Environment. Environment is not specified in this standard but should be agreed upon by those responsible for punching, reading, transporting and storing cards.

Proposed Appendix. Environmental Considerations

1. Cardstock Dimensional Instability

Cardstock used for punched cards is inherently subject to changes in dimensions with changes in environmental conditions, particularly changes in relative humidity (RH).

1.1 Variation of Card Dimensions. At a constant temperature of 73°F, a change in relative humidity from 20% to 75%, or from 75% to 20%, will change the dimensions of the card as much as 0.018 inch in length and 0.023 inch in width.

Temperature variations within ranges normally maintained for human comfort will not substantially affect dimensional changes as stated above.

1.2 Variation in Hole Location. The location of punched holes will vary in accordance with the above variations in card dimensions.

1.3 Additional Information. For additional information, see the Appendix (X3.2/302) to the American Standard for General Purpose Paper Cards for Information Processing (X3/34).

2. User Responsibility

The users of card equipment must accept the responsibility for maintaining the proper environment to assure reliable information interchange.

Maximum reliability of information interchange will result when cards are punched, read, transported and stored at the same temperature and relative humidity levels. Excursions in relative humidity in excess of 20% should be avoided after the cards are punched. Cards exposed to relative humidities above 75% undergo dimensional changes, some of which, due to relaxation of paper fiber stresses, may not be reversible when the cards are reconditioned to relative humidities below 75%.

Expository Remarks on the Proposed American Standard for Rectangular Holes in Twelve-Row Punched Cards

The reader of the proposed standard may note that the provisions of the specification have been expanded from a previous standard published by the EIA, RS292. Of particular interest in this respect is the change in the horizontal tolerance of the hole location.

RS 292, published January, 1964, specifies ± 0.007 inch horizontal tolerance and ± 0.010 inch vertical tolerance when punching cards conditioned to 50% RH and 73°F. These tolerances have generally been interpreted to apply to pre-punched cards (at time of card manufacture, i.e., controlled environment).

Since the development of RS292 in 1960 it has become apparent that the horizontal tolerance specified should be changed to include the broader field conditions associated with information interchange.

Thus, in the X3.2.3 proposal, X3.2/374 (X3.2.3/132) May 17, 1966, an approach broader in scope and more meaningful to the card user is taken, that is, tolerance standards and responsibilities are clearly assigned to all parties concerned with information interchange. This standard with its appendix covers location of holes at the time of punching as well as at the time of reading together with recommendations for transportation and storage.

The punching and reading tolerances specified were arrived at after extensive laboratory testing and careful consideration of the broad range of conditions under which punched cards are used. Equal consideration was also given to the capabilities of equipment currently in the field.

The tolerances now incorporated within the proposed American Standard for Rectangular Holes in Twelve-Row Punched Cards have received unanimous approval of both ASA X3.2.3 and X3.2.