

American National Standard

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FIPS PUB 13
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Front Cover

rectangular holes in twelve-row punched cards



american national standards institute, inc.
1430 broadway, new york, new york 10018

X3.21-1967

This standard was approved as a Federal Information Processing Standard by the Office of Management and Budget on June 16, 1971.

Details concerning the use of this standard within the Federal Government are contained in FIPS PUB 13, RECTANGULAR HOLES IN TWELVE-ROW PUNCHED CARDS. For a complete list of the publications available in the FEDERAL INFORMATION PROCESSING STANDARDS Series, write to the Office of Technical Information and Publications, National Bureau of Standards, Washington, D.C. 20234.

American National Standard Rectangular Holes in Twelve-Row Punched Cards

American National Standard

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American National Standard

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Foreword

(This Foreword is not a part of the USA Standard Rectangular Holes in Twelve-Row Punched Cards, X3.21-1967.)

This publication is one of a series of standards relating to information interchange between information processing systems, communications systems, and associated equipment through the medium of punched paper cards. This standard specifies the size and locations of rectangular holes in twelve-row, 3¼ inch wide punched cards.

A related standard, X3.11-1966 specifies the dimensions, quality of paper, and test methods of 7⅞ inch length cards for information processing.

This standard was developed by a group of highly qualified and experienced punched-card specialists representing manufacturers and users of card stock, cards, and card processing equipment. Adherence to this standard will eliminate many misunderstandings.

Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the United States of America Standards Institute, 10 East 40th Street, New York, N.Y. 10016.

The USA Standards Committee on Computers and Information Processing, X3, had the following personnel at the time it processed and approved this standard.

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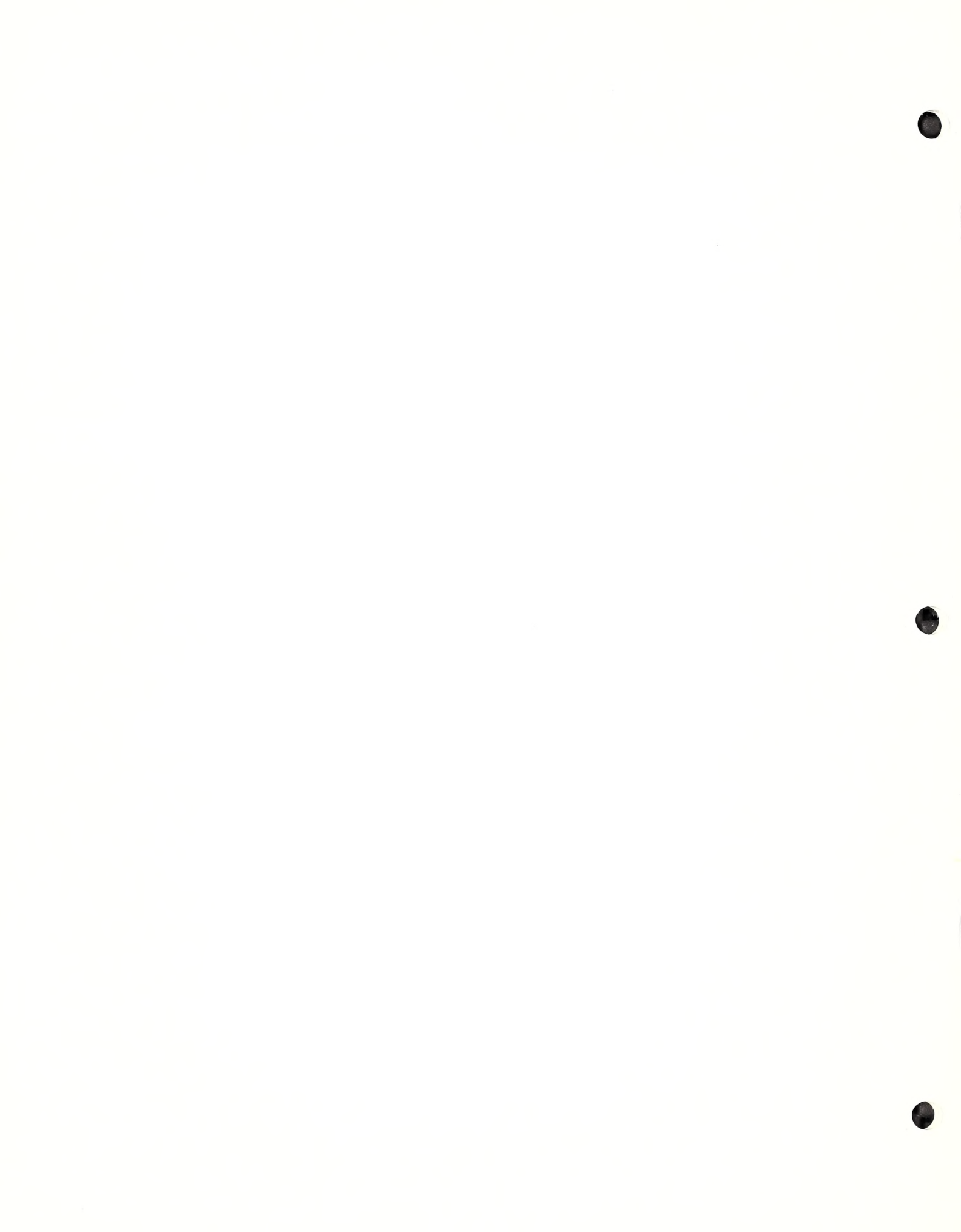
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American National Standard Rectangular Holes in Twelve-Row Punched Cards

1. Scope

This standard specifies the size and location of rectangular holes in twelve-row $3\frac{1}{4}$ -inch wide punched cards. To be a processable document, suitable for information interchange, cards must also meet USA Standard Specifications for General Purpose Paper Cards for Information Processing, X3.11-1966.

2. Detail Requirements (See Fig. 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 2.2.1.1 and 2.2.2.1.)¹ The rectangles are dimensioned as follows:

Outer	
height:	0.126 inch
length:	0.056 inch
Inner	
height:	0.124 inch
length:	0.054 inch

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

2.2.1 Longitudinal Grid Lines. 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. Transverse grid lines (columns) shall be spaced at increments of 0.087 inch from a transverse grid line spaced 0.251 inch from the Y datum line.

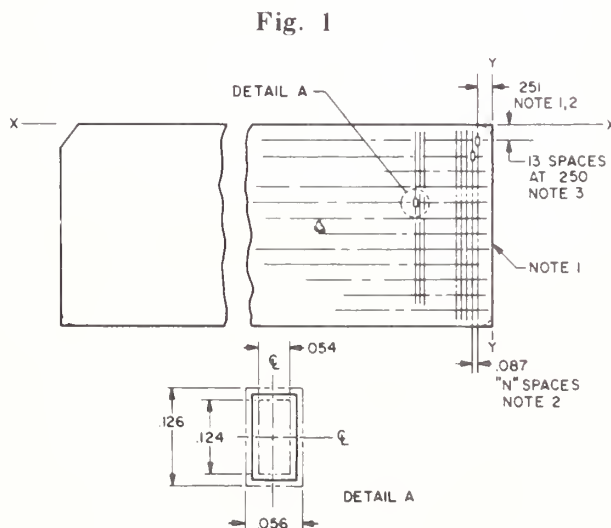
2.2.2.1 Y Datum Line—A vertical line exactly at right angles to the X datum line and intersecting the mid-point of the right edge of the card.

2.2.3 Tolerance on Hole Location.

2.2.3.1 Reading Tolerance—The centerline 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 centerlines of each hole should be within 0.010 inch of their corresponding longitudinal and transverse grid lines at the time of punching.

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



All dimensions are in inches.

NOTES:

- (1) Y - Y is perpendicular to X - X and intersects the mid-point of right edge of card.
- (2) Vertical centerline of holes may vary ± 0.010 from Y - Y at time of punching (see 2.2.3.2) and ± 0.018 at time of reading.
- (3) Horizontal centerline of holes may vary ± 0.010 from X - X at time of punching (see 2.2.3.2) and ± 0.018 at time of reading.

Appendix

(This Appendix is not a part of the USA Standard Rectangular Holes in Twelve-Row Punched Cards, X3.21-1967, but is included to facilitate its use.)

Environmental Considerations

A1. 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).

A1.1 Variation of Card Dimensions. At a constant temperature of 73°F, a change in relative humidity from 20 percent to 75 percent, or from 75 percent to 20 percent, 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.

A1.2 Variation in Hole Location. The location of punched holes will vary in accordance with the above variations in card dimensions.

A1.3 Additional Information. For additional information, see the Appendix to the USA Standard Specifications for General Purpose Paper Cards for Information Processing, X3.11-1966.

A2. 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 RH levels. Excursions in RH in excess of 20 percent should be avoided after the cards are punched. Cards exposed to above 75-percent RH undergo dimensional changes, some of which, due to relaxation of paper fiber stresses, may not be reversible when the cards are reconditioned to below 75-percent RH.

American National Standards on Computers and Information Processing

- X3.1-1969** Synchronous Signaling Rates for Data Transmission
- X3.2-1970** Print Specifications for Magnetic Ink Character Recognition
- X3.3-1970** Bank Check Specifications for Magnetic Ink Character Recognition
- X3.4-1968** Code for Information Interchange
- X3.5-1970** Flowchart Symbols and Their Usage in Information Processing
- X3.6-1965** Perforated Tape Code for Information Interchange
- X3.9-1966** FORTRAN
- X3.10-1966** Basic FORTRAN
- X3.11-1969** Specifications for General Purpose Paper Cards for Information Processing
- X3.12-1970** Vocabulary for Information Processing
- X3.14-1973** Recorded Magnetic Tape for Information Interchange (200 CPI, NRZI)
- X3.15-1966** Bit Sequencing of the American National Standard Code for Information Interchange in Serial-by-Bit Data Transmission
- X3.16-1966** Character Structure and Character Parity Sense for Serial-by-Bit Data Communication in the American National Standard Code for Information Interchange
- X3.17-1966** Character Set for Optical Character Recognition
- X3.18-1967** One-Inch Perforated Paper Tape for Information Interchange
- X3.19-1967** Eleven-Sixteenths Inch Perforated Paper Tape for Information Interchange
- X3.20-1967** Take-Up Reels for One-Inch Perforated Paper Tape for Information Interchange
- X3.21-1967** Rectangular Holes in Twelve-Row Punched Cards
- X3.22-1973** Recorded Magnetic Tape for Information Interchange (800 CPI, NRZI)
- X3.23-1968** COBOL
- X3.24-1968** Signal Quality at Interface Between Data Processing Terminal Equipment and Synchronous Data Communication Equipment for Serial Data Transmission
- X3.25-1968** Character Structure and Character Parity Sense for Parallel-by-Bit Communication in the American National Standard Code for Information Interchange
- X3.26-1970** Hollerith Punched Card Code
- X3.27-1969** Magnetic Tape Labels for Information Interchange
- X3.28-1971** Procedures for the Use of the Communication Control Characters of American National Standard Code for Information Interchange in Specified Data Communication Links
- X3.29-1971** Specifications for Properties of Unpunched Oiled Paper Perforator Tape
- X3.30-1971** Representation for Calendar Date and Ordinal Date for Information Interchange
- X3.31-1973** Structure for the Identification of the Counties of the United States for Information Interchange
- X3.34-1972** Interchange Rolls of Perforated Tape for Information Interchange
- X3.38-1972** Identification of States of the United States (Including the District of Columbia) for Information Interchange
- X3.39-1973** Recorded Magnetic Tape for Information Interchange (1600 CPI, PE)
- X3.40-1973** Unrecorded Magnetic Tape for Information Interchange (9-Track 200 and 800 CPI, NRZI, and 1600 CPI, PE)

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