American National Standard

Adopted for Use by
the Federal Government

FIPS PUB 13
See Notice on Inside
Front Cover

rectangular holes in twelve-row punched cards

X3.21-1967

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

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.

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American National Standard Rectangular Holes in Twelve-Row Punched Cards

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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 7⅜ 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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The Physical Standards Group of the X3.2.3 Task Group on Punched Cards developed this standard and had the following personnel:

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American National Standard Rectangular Holes in Twelve-Row Punched Cards

1. Scope

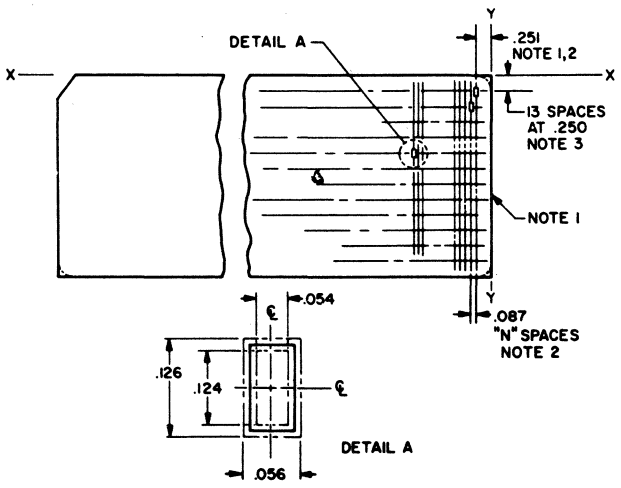
This standard specifies the size and location of rectangular holes in twelve-row 3¼-inch wide punched cards. To be a processable document, suitable for information interchange, cards must also meet USA Standard Specifications for General Purpose Paper Cards for Information Processing, X3.11-1966.

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.) 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



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.

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 logitudinal 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 logitudinal 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.

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 for Information Processing

X3.1-1976 Synchronous Signaling Rates for Data Transmission

X3.2-1970 (R1976) Print Specifications for Magnetic Ink Character Recognition

X3.3-1970 (R1976) Bank Check Specifications for Magnetic Ink Character Recognition

X3.4-1977 Code for Information Interchange

X3.5-1970 Flowchart Symbols and Their Usage in Information Processing

X3.6-1965 (R1973) Perforated Tape Code for Information Interchange

X3.9-1978 FORTRAN

X3.11-1969 Specification for General Purpose Paper Cards for Information Processing

X3.14-1973 Recorded Magnetic Tape for Information Interchange (200 CPI, NRZI)

X3.15-1976 Bit Sequencing of the American National Standard Code for Information Interchange in Serial-by-Bit Data Transmission

X3.16-1976 Character Structure and Character Parity Sense for Serial-by-Bit Data Communication in the American National Standard Code for Information Interchange

X3.17-1977 Character Set and Print Quality for Optical Character Recognition (OCR-A)

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X3.19-1974 Eleven-Sixteenths-Inch Perforated Paper Tape for Information Interchange

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X3.21-1967 Rectangular Holes in Twelve-Row Punched Cards

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X3.23-1974 Programming Language COBOL

X3.24-1968 Signal Quality at Interface between Data Processing Terminal Equipment and Synchronous Data Communication Equipment for Serial Data Transmission

X3.25-1976 Character Structure and Character Parity Sense for Parallel-by-Bit Data Communication in the American National Standard Code for Information interchange

X3.26-1970 Hollerith Punched Card Code

X3.27-1978 Magnetic Tape Labels and File Structure for Information Interchange

X3.28-1976 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

X3.32-1973 Graphic Representation of the Control Characters of American National Standard Code for Information Interchange

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X3.36-1975 Synchronous High-Speed Data Signaling Rates between Data Terminal Equipment and Data Communication Equipment

X3.37-1977 Programming Language APT

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)

X3.40-1976 Unrecorded Magnetic Tape for Information Interchange (9-Track 200 and 800 CPI, NRZI, and 1600 CPI, PE)

X3.41-1974 Code Extension Techniques for Use with the 7-Bit Coded Character Set of American National Standard Code for Information Interchange

X3.42-1975 Representation of Numeric Values in Character Strings for Information Interchange

X3.43-1977 Representations of Local Time of the Day for Information Interchange

X3.44-1974 Determination of the Performance of Data Communication Systems

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X3.48-1977 Magnetic Tape Cassettes for Information Interchange (3.810-mm [0.150-in] Tape at 32 bpmm [800 bpi], PE)

X3.49-1975 Character Set for Optical Character Recognition (OCR-B)

X3.50-1976 Representations for U.S. Customary, SI, and Other Units to Be Used in Systems with Limited Character Sets

X3.51-1975 Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange

X3.52-1976 Unrecorded Single-Disk Cartridge (Front Loading, 2200 BPI), General, Physical, and Magnetic Requirements

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X3.56-1977 Recorded Magnetic Tape Cartridge for Information Interchange 4 Track, 0.250 Inch (6.30 mm), 1600 bpi (63 bpmm), Phase Encoded

X3.57-1977 Structure for Formatting Message Headings for Information Interchange Using the American National Standard Code for Information Interchange for Data Communication Systems Control

X3.58-1977 Unrecorded Eleven-Disk Pack General, Physical, and Magnetic Requirements

X3.60-1978 Programming Language Minimal BASIC

X3.61-1978 Representation of Geographic Point Locations for Information Interchange

X3.62-1979 Paper Used in Optical Character Recognition (OCR) Systems

X3.66-1979 Advanced Data Communication Control Procedures (ADCCP)

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