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U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards



130 MM (5.25 IN) FLEXIBLE DISK  
CARTRIDGE TRACK FORMAT USING  
MODIFIED FREQUENCY MODULATION  
RECORDING AT 7958 BPRAD  
ON TWO SIDES - 1.9 TPMM (48 TPI)  
FOR INFORMATION INTERCHANGE

CATEGORY: HARDWARE STANDARD

CATEGORY: INTERCHANGE CODES AND MEDIA

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FIPS PUB 117

**U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary**  
**NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director**

**Foreword**

The Federal Information Processing Standards Publication Series of the National Bureau of Standards is the official publication relating to standards adopted and promulgated under the provisions of Public Law 89-306 (Brooks Act) and under Part 6 of Title 15, Code of Federal Regulations. These legislative and executive mandates have given the Secretary of Commerce important responsibilities for improving the utilization and management of computers and automatic data processing in the Federal Government. To carry out the Secretary's responsibilities, the NBS, through its Institute for Computer Sciences and Technology, provides leadership, technical guidance, and coordination of Government efforts in the development of guidelines and standards in these areas.

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James H. Burrows, Director  
Institute for Computer Sciences and Technology

**Abstract**

This standard prescribes a set of physical track format specifications for ~~one-sided~~ double-density, 130 mm (5.25 in) flexible disk cartridges which have a data density of 7958 bits per radian (bprad) and 40 tracks at a track density of 1.9 tracks per millimeter (tpmm) (48 tracks per inch (tpi)). Citing these specifications will help to ensure that interchange parties can reliably interchange ~~data files~~ between information processing systems.

**Key words.** Computers; computer system hardware; data interchange; data processing; data processing equipment; flexible disk cartridges; information systems; magnetic recording; standards.

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Federal Information  
Processing Standards Publication 117

1985 September 30



Announcing the Standard for

**130 mm (5.25 in) Flexible Disk Cartridge Track Format  
Using Modified Frequency Modulation Recording at 7958 bprad on  
Two Sides - 1.9 tpmm (48 tpi) for Information Interchange**

Federal Information Processing Standards Publications are issued by the National Bureau of Standards pursuant to section 111(f)(2) of the Federal Property and Administrative Services Act of 1949, as amended, Public Law 89-306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 Code of Federal Regulations (CFR).

**Name of Standard.** 130 mm (5.25 in) Flexible Disk Cartridge Track Format Using Modified Frequency Modulation Recording at 7958 bprad on Two Sides - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 117).

**Category of Standard.** Hardware, Interchange Codes and Media.

**Explanation.** This standard prescribes a set of physical track format specifications for two-sided, double-density, 130 mm (5.25 in) flexible disk cartridges which have a data density of 7958 bits per radian (bprad) and 40 tracks at a track density of 1.9 tracks per millimeter (tpmm) (48 tracks per inch (tpi)). Citing these specifications will help to ensure that interchange parties can reliably interchange data files between information processing systems.

In order to ensure interchangeability of data between information processing systems by use of a physically removable medium, three distinct levels of compatibility specifications are necessary:

- 1) specifications for the unrecorded interchange medium (e.g., the flexible disk cartridge),
- 2) specifications for the physical track format (the specifications in this document),
- 3) specifications for the logical track format (FIPS PUB 118).

Interchange of text, rather than data files, requires other specifications in addition to the above three levels.

The track format specifications contained in this standard are only for one type of flexible disk cartridge recording technology. Other Federal Information Processing Standards Publications (FIPS PUBS) specify physical track formats for other major types of flexible disk cartridge recording technology and labelling and file structure (logical track format) specifications for use with all types of flexible disk cartridges.

This family of specifications was developed through the international voluntary industry standards process. In this process, the American National Standards Institute (ANSI) represents the United States. The National Bureau of Standards (Institute for Computer Sciences and Technology) has provided the international representative, whose job has been to focus and coordinate U.S. interests for ANSI during the development of these physical track format standards.

**Maintenance Agency.** Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

**Cross Index.** International Organization for Standardization (ISO) 7487/3, Data Interchange on 130 mm (5.25 in) Flexible Disk Cartridges Using Modified Frequency Modulation Recording at 7 958 ftprad, 1,9 tpmm (48 tpi), on Both Sides - Part 3: Track Format B.

**Related Documents.**

a. American National Standard Code for Information Interchange, X3.4-1977, FIPS PUB 1-2.

b. American National Standard Code Extension Techniques for Use with the 7-Bit Coded Character Set of American National Standard Code for Information Interchange, X3.41-1974, FIPS PUB 1-2.

c. American National Standard Additional Controls for Use with American Standard Code for Information Interchange, X3.64-1979, FIPS PUB 86.

d. American National Standard for Information Systems - Two-Sided, Double-Density, Unformatted, 5.25-Inch (130-mm), 48-tpi (1.9-tpmm), Flexible Disk Cartridge for 7958 bpr Use - General, Physical, and Magnetic Requirements, X3.125-1985.

**Applicability.** This standard is applicable to the acquisition and use of all recording and reproducing equipment employing 130 mm (5.25 in) flexible disk cartridges with the following characteristics: modified frequency modulation recording at 7958 bprad on two sides, and 40 tracks at a track density of 1.9 tpmm (48 tpi). Federal information processing systems employing such equipment, including associated software, should provide the capability to accept and

generate recorded flexible disk cartridges in compliance with the requirements set forth in this standard. This standard should be used for the interchange of flexible disk cartridges unless the interchange parties can agree upon an alternate interchange format which is more efficient, convenient, and cost effective.

**Specifications.** This standard incorporates by reference (with qualifications as noted) the technical specifications of ISO 7487/3, Data Interchange on 130 mm (5.25 in) Flexible Disk Cartridges Using Modified Frequency Modulation Recording at 7 958 ftprad, 1,9 tpm (48 tpi), on Both Sides - Part 3: Track Format B.

**Qualifications.**

a. ISO 7487/3 specifies the use of ISO 646, ISO 2022, and ISO 4873. For the purposes of this standard, American National Standard Code for Information Interchange, X3.4-1977 (defined in FIPS PUB 1-2), American National Standard Code Extension Techniques for Use with the 7-Bit Coded Character Set of American National Standard Code for Information Interchange, X3.41-1974 (defined in FIPS PUB 1-2), and American National Standard Additional Controls for Use with American Standard Code for Information Interchange, X3.64-1979 (defined in FIPS PUB 36) replace all references to ISO 646, 2022, and 4873.

b. Replace section 4.1.2, Track Location Tolerance of the Recorded Flexible Disk Cartridge, with the following section:

4.1.2 Track Location Tolerance of the Recorded Flexible Disk Cartridge

The centrelines of the recorded tracks shall be within  $\pm 0.085$  mm (0.0033 in) of the nominal positions, when measured in the testing environment described in this section.

The testing environment shall consist of the following conditions:

temperature:  $23 \pm 2^{\circ}\text{C}$  ( $73 \pm 4^{\circ}\text{F}$ )

relative humidity (RH): 40 to 60%

conditioning before testing: 24 hours minimum.

The temperature and the RH shall be measured in the air immediately surrounding the cartridge. The ambient stray magnetic field shall not exceed 4000 A/m (50 Oe).

**Implementation Schedule.** This standard becomes effective April 1, 1986. Use by Federal agencies is strongly recommended when such use contributes to operational benefits, efficiency, or economy.

**Special Information.** Each agency has the responsibility for the procurement of unrecorded, two-sided, double-density, 130 mm (5.25 in) flexible disk cartridges for use with this standard. American National Standard for Information Systems - Two-Sided, Double-Density, Unformatted, 5.25-Inch (130-mm), 48-tpi (1.9-tpmm), Flexible Disk Cartridge for 7958 bpr Use - General, Physical, and Magnetic Requirements, X3.125-1985, may be cited in agency procurements. While X3.125-1985 is not intended to be sufficient by itself as a procurement specification document, it can serve as an important basis for specifying compatibility. Each agency can also utilize the General Services Administration multiple award schedule for flexible disk cartridges (FSC GROUP 70 PART I SECTION B Class 7045-0001).

**Where to Obtain Copies.** Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. (Sale of the included specifications document is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 117 (FIPS PUB 117), and title. Payment may be made by check, money order, purchase order, credit card, or deposit account.

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