

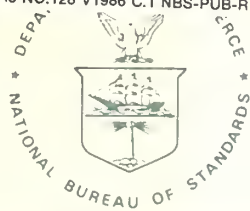
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COMPUTER GRAPHICS METAFILE (CGM)

CATEGORY: SOFTWARE STANDARD
SUBCATEGORY: GRAPHICS

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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, guidelines, and documents 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 standards, guidelines and documents in these areas.

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

Abstract

This publication announces the adoption of the American National Standard for Computer Graphics Metafile, ANSI X3.122-1986, as a Federal Information Processing Standard (FIPS). ANSI X3.122-1986 is a graphics data interface standard which specifies a file format suitable for the description, storage, and communication of graphical (pictorial) information in a device independent manner. The purpose of the standard is to facilitate the transfer of graphical information between different graphical software systems, different graphical devices, and different computer graphics installations.

Key words: Computer Graphics Metafile (CGM); Federal Information Processing Standard (FIPS); graphics data interface standard; metafile; picture transfer; software.

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**Federal Information
Processing Standards Publication 128**

1987 March 16

Announcing the Standard for

COMPUTER GRAPHICS METAFILE (CGM)



Federal Information Processing Standards Publications (FIPS PUBS) 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).

1. **Name of Standard.** Computer Graphics Metafile (CGM) (FIPS PUB 128).
2. **Category of Standard.** Software Standard, Graphics.
3. **Explanation.** This publication announces the adoption of the American National Standard for Computer Graphics Metafile, ANSI X3.122-1986, as a Federal Information Processing Standard (FIPS). ANSI X3.122-1986 is a graphics data interface standard which specifies a file format suitable for the description, storage, and communication of graphical (pictorial) information in a device independent manner. The purpose of the standard is to facilitate the transfer of graphical information between different graphical software systems, different graphical devices, and different computer graphics installations.
4. **Approving Authority.** Secretary of Commerce.
5. **Maintenance Agency.** Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).
6. **Cross Index.** American National Standard X3.122-1986, Computer Graphics Metafile (CGM).
7. **Related Documents.**
 - a. Federal Information Processing Standards Publication (FIPS PUB) 120, Graphical Kernel System (GKS).
 - b. Federal Information Resources Management Regulation 201-8.1, Federal ADP and Telecommunications Standards.
 - c. American National Standard Graphical Kernel System, GKS, ANSI/ASC X3.124-1985.
 - d. ISO 646-1983, Information Processing — 7-Bit Coded Character Set for Information Interchange.
 - e. ISO 2022-1982, Information Processing — ISO 7-Bit and 8-Bit Coded Character Sets — Code Extension Techniques.
 - f. ISO 2375-1980, Information Processing — Character Set Registration.
 - g. ISO 7942-1985, Information Processing Systems — Computer Graphics — Functional Specification of the Graphical Kernel System (GKS).
 - h. ISO 6429-1983, Information Processing Systems — ISO 7-Bit and 8-Bit Coded Character Sets — Additional Control Functions for Character-Imaging Devices.
 - i. ISO 8632-1986, Information Processing Systems — Computer Graphics Metafile for the Storage and Transfer of Picture Description Information (Part 1: Functional Specifications; Part 2: Character and Coding; Part 3: Binding and Coding; Part 4: Clear Text Encoding).
8. **Objectives.** The primary objectives of this standard are:
 - To allow the portability of graphics data among different graphics installations and devices. This encourages a uniform interface for noninteractive picture description.
 - To promote the exchange of graphic information enabling installations to share data and reduce time spent recomputing in efforts to regenerate graphics data.

- To promote the use of a standard set of elements using standard terminology, which aids graphics programmers in using graphics methods.

9. Applicability.

a. This standard is intended for use in computer graphics applications that are either developed or acquired for government use. Although this standard was not developed specifically for the Printing/Graphics Arts industry, it may be used in these applications whenever desirable.

b. The use of this standard is strongly recommended when one or more of the following situations exist:

- A graphics metafile is maintained at a central facility for a decentralized system that employs graphics devices of different makes and models that must utilize the data.
- A graphics metafile is required to preserve picture data when conversion or migration from one graphics system to another is necessary and the two systems are not necessarily compatible.
- A graphics metafile is intended for information interchange between a source system and a target system that are not necessarily compatible.

c. Nonstandard features should be used only when the needed operation or function cannot reasonably be implemented with the standard features alone. Although nonstandard features can be very useful, it should be recognized that the use of these or any other nonstandard elements may make the interchange of graphics picture data and future conversion more difficult and costly.

10. Specifications. American National Standard ANSI X3.122-1986, Computer Graphics Metafile, defines the scope of the specifications, the syntax and semantics of the CGM elements and requirements for a conforming implementation. All of these specifications apply to Federal Government implementation of this standard.

11. Implementation. The implementation of this standard involves two areas of consideration: acquisition of CGM implementations and interpretations of the standard.

11.1 Acquisition of CGM Implementations. This publication is effective August 10, 1987. Implementations acquired for Federal use after this date should implement the standard. Conformance to this standard should be considered whether computer graphics metafile systems are developed internally, acquired as part of an ADP system procurement, acquired by separate procurement, used under an ADP leasing arrangement, or specified for use in contracts for programming services.

A transition period provides time for industry to produce metafile systems conforming to the standard. The transition period begins on the effective date and continues for twelve (12) months thereafter. The provisions of this publication apply to orders placed after the date of this publication; however, a metafile package not conforming to this standard may be acquired for interim use during the transition period.

11.2 Interpretation of FIPS CGM. Resolution of questions regarding this standard will be provided by NBS. Questions concerning the content and specifications should be addressed to:

Director
Institute for Computer Sciences and Technology
ATTN: CGM Interpretation
National Bureau of Standards
Gaithersburg, MD 20899

12. Waivers. Under certain exceptional circumstances the head of the agency is authorized to waive the application of the provisions of this FIPS PUB. Exceptional circumstances which would warrant a waiver are:

a. Significant, continuing cost or efficiency disadvantages will be encountered by the use of this standard and,

b. The interchange of information between the system for which the waiver is sought and other systems is not anticipated.

Agency heads may act only upon written waiver requests containing the information detailed above. Agency heads may approve requests for waivers only by a written decision which explains the basis upon which the agency head made the required finding(s). A copy of each such decision, with procurement sensitive or

classified portions clearly identified, shall be sent to the Director, Institute for Computer Sciences and Technology, National Bureau of Standards, Gaithersburg, MD 20899.

When the determination on a waiver request applies to the procurement of equipment and/or services, a notice of the waiver determination must be published in the *Commerce Business Daily* as a part of the notice of solicitation for offers of an acquisition or, if the waiver determination is made after that notice is published, by amendment to such notice.

A copy of the waiver request, any supporting documents, the document approving the waiver request and any supporting and accompanying document(s), with such deletions as the agency is authorized and decides to make under 5 U.S.C. Sec. 552(b), shall be part of the procurement documentation and retained by the agency.

13. Where to Obtain Copies. Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 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 128 (FIPSPUB128), and title. Payment may be made by check, money order, purchase order, credit card, or deposit account.

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