INTERNATIONAL STANDARD

ISO/IEC 8632-1

Second edition
1992-10-01

AMENDMENT 2
1995-07-01

Information technology — Computer graphics — Metafile for the storage and transfer of picture description information —

Part 1:
Functional specification

AMENDMENT 2: Application structuring extensions

Technologies de l'information — Infographie — Métafichier de stockage et de transfert des informations de description d'images —

Partie 1: Description fonctionnelle

AMENDEMENT 2: Extensions de structure d'application

Reference number
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 2 to International Standard ISO/IEC 8632-1:1992 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 24, *Computer graphics and image processing*.

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Information technology - Computer graphics - Metafile for the storage and transfer of picture description information -

Part 1: Functional specification

AMENDMENT 2: Application structuring extensions

Pages ii-viii

Add the following to Contents:

Information technology - Computer graphics - Metafile for the storage and transfer of picture description information -

Part 1: Functional specification

AMENDMENT 2: Application structuring extensions

Pages ii-viii

Add the following to Contents:

0 Introduction

Subclause 0.9 Versions, page xiii:

Change the 4th sentence to read:

"The following versions are currently defined: Version 1 (one); Version 2 (two); Version 3 (three); Version 4 (four)."

Change Note 1 by adding a sentence before the 1st sentence:

"A valid Version 3 metafile is also a valid Version 4 metafile."

Change Note 2 by adding a sentence after the final period:

"Version 4 metafiles are defined by ISO/IEC 8632:1992/Amd.2."

1 Scope

Clause 1, Page 1:

Replace the 2nd sentence of the 1st paragraph to read:

"The file format consists of an ordered set of elements that may be used to describe pictures in a way that is compatible between systems of different architectures, compatible with devices of differing capabilities and design, and meaningful to application constituencies."

Replace the 2nd sentence of the 2nd paragraph to read:

"The elements are organized into groups that delimit major structures (metafiles, pictures, and application structures), that specify the representations used within the metafile, that control the display of the picture, that perform basic drawing actions, that control the attributes of the basic drawing actions, that allow application-specific structuring to be overlaid on the graphic content, and that provide access to non-standard device capabilities."

Replace the 3rd paragraph with:

"The metafile is defined in such a way that, in addition to sequential access to the whole metafile, random access to individual pictures and individual context-independent application structures is well-defined. Applications which require random access to pictures and/or context-independent application structures within pictures may, within the metafile, define directories to these pictures and/or context-independent application structures. The metafile may then be opened and randomly accessed without interpreting the entire metafile."

3 Definitions

Subclause 3.1, page 9:

Add the following definition:

"**3.1.105 application structure:** A sequence of metafile elements delimited by the BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE elements, containing

one BEGIN APPLICATION STRUCTURE BODY element, and optionally containing one or more APPLICATION STRUCTURE ATTRIBUTE elements."

Subclause 3.2, page 9:

Add the following abbreviation to the list of abbreviations:

"APS Application Structure"

4 Concepts

4.1 Introduction

Subclause 4.1, page 10:

Change 1st sentence to read:

"The objective of the Computer Graphics Metafile (CGM) is to provide for the description, storage, and communication of graphical information together with related, application-specific information in a device-independent manner."

Change the 2nd element class in the 1st paragraph to read:

"- Metafile Descriptor Elements, which describe the functional content, default conditions, identification, and characteristics of the CGM; and optionally, define a directory."

Change the 3rd element class in the 1st paragraph to read:

"- Picture Descriptor Elements, which set the interpretation modes of attribute elements for each picture and optionally, define a directory to the application structures contained in each picture."

Replace the 9th element class in the 1st paragraph with:

"-Segment elements, which enable the grouping of graphic objects for graphical operations such as copying.

-Application structure elements, which enable the grouping of elements for retrieval, electronic linking, and other specific application-dependent operations."

Add the following sentence after the last sentence of the 4th paragraph:

"In Version 4 metafiles, graphical output primitives, attributes, control elements, and application structure attributes may be grouped in application structures."

4.2 Delimiter Elements

Subclause 4.2, page 11:

Change the 1st sentence of the 5th paragraph to read:

"In Version 2, Version 3, and Version 4 metafiles, primitives may be grouped together to form a composite primitive known as a closed figure."

Change the 1st sentence of the 6th paragraph to read:

one BEGIN APPLICATION STRUCTURE BODY element, and optionally containing one or more APPLICATION STRUCTURE ATTRIBUTE elements."

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Change the 1st sentence of the 6th paragraph to read:

"In Version 2, Version 3, and Version 4 metafiles, groups of elements, called segments, are delimited by BEGIN SEGMENT and END SEGMENT."

Change the 1st sentence of the 7th paragraph to read:

"In Version 3 and Version 4 metafiles, a compound clipping and shielding region may be defined by line and filled-area elements occurring between BEGIN PROTECTION REGION and END PROTECTION REGION."

Change the 1st sentence of the 8th paragraph to read:

"In Version 3 and Version 4 metafiles, a tile array may be defined by tile elements occurring between BEGIN TILE ARRAY and END TILE ARRAY."

Add a new paragraph after the 10th (the last) paragraph as follows:

"In Version 4 metafiles, application structures consisting of groups of elements within picture bodies, are delimited by BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE. Between these delimiters the BEGIN APPLICATION STRUCTURE BODY element separates the APPLICATION STRUCTURE ATTRIBUTE elements in the application structure descriptor from the other elements contained in the application structure body."

4.3 Metafile descriptor elements

Subclause 4.3, page 11:

Add the following element to the element list in the 1st paragraph:

"PICTURE DIRECTORY"

Add a new Subclause 4.3.2.7 Version 4 set, page 16:

"4.3.2.7 Version 4 set

The Version 4 set may be used to indicate all the elements in Version 3 and the elements:

PICTURE DIRECTORY
APPLICATION STRUCTURE DIRECTORY
BEGIN APPLICATION STRUCTURE
BEGIN APPLICATION STRUCTURE BODY
END APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE"

Add a new Subclause 4.3.5 Picture directory, page 21:

"4.3.5 Picture directory

The PICTURE DIRECTORY element contains locations of the pictures in a metafile. The picture directory contains a list of picture identifiers and their locations relative to the BEGIN METAFILE element. The picture directory may optionally contain the location of the APPLICATION STRUCTURE DIRECTORY element in each picture relative to the BEGIN METAFILE element. An interpreter wishing to randomly address a picture in a metafile with a picture directory need

only interpret the Metafile Descriptor and skip to the locations of the picture specified in the PICTURE DIRECTORY. The next element read will be the desired BEGIN PICTURE."

4.4 Picture descriptor elements

Subclause 4.4, page 21:

Add the following element to the element list in the 1st paragraph:

"APPLICATION STRUCTURE DIRECTORY"

Change the 1st sentence of the 3rd paragraph (the last) to read:

"In Version 2, Version 3, and Version 4 metafiles, some of the Picture Descriptor elements may appear within the picture body."

Add a new Subclause 4.4.10 Application structure directory, page 25.

"**4.4.10 Application structure directory**

The APPLICATION STRUCTURE DIRECTORY element contains the locations of the various application structures in a picture. The application structure directory contains a list of application structure identifiers and their locations relative to the BEGIN PICTURE element. APSs within a metafile containing multiple pictures can be accessed directly in two steps. First, the picture directory is used to locate a picture and possibly the application structure directory for the picture. 2nd, the APSs in the picture are located using the application structure directory."

4.5 Control elements

Subclause 4.5.2, page 25:

Change the 1st sentence of the 2nd paragraph to read:

"In Version 3 and Version 4 metafiles, primitives may also be clipped against more general regions as defined by BEGIN PROTECTION REGION and END PROTECTION REGION, and as controlled by PROTECTION REGION INDICATOR (see 4.5.4)."

4.6 Graphical primitive elements

Subclause 4.6.1.5, page 34:

Change the 1st sentence of the 1st paragraph to read:

"In Version 2, Version 3, and Version 4 metafiles, line clipping is controlled by the LINE CLIPPING MODE element, which can have one of the following values: 'locus', 'shape', or 'locus then shape'."

Subclause 4.6.2.3, page 35:

Change the 1st sentence of the 3rd paragraph to read:

"In Version 2, Version 3, and Version 4 metafiles, marker clipping is controlled by the MARKER CLIPPING MODE element, which can have one of the following values: 'locus', 'shape', or 'locus then shape'."

only interpret the Metafile Descriptor and skip to the locations of the picture specified in the PICTURE DIRECTORY. The next element read will be the desired BEGIN PICTURE."

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4.7 Attribute elements

Subclause 4.7.1.2, page 59:

Change Note 2 to read:

"Note 2 The LINE JOIN element is only permissible in Version 3 and Version 4 metafiles, therefore only the 'unspecified' style is available in Version 1 and Version 2 metafiles."

Change Note 3 to read:

"Note 3 The LINE TYPE CONTINUATION element is only permissible in Version 3 and Version 4 metafiles, therefore only the 'unspecified' style is available in Version 1 and Version 2 metafiles."

Subclause 4.7.2.2, page 61:

Change to read:

"There are no individual marker attributes in metafiles of Versions 1, 2, 3, and 4 -- all marker elements are bundled."

Subclause 4.7.3.2, page 76:

Change the 2nd sentence from the top of the page to read:

"Version 3 and Version 4 metafiles allow selection of one of several specific ways in which the text shall fit the box (see below)."

Subclause 4.7.3.2, page 77:

Change the 1st sentence of Note 4 to read:

"4 The RESTRICTED TEXT TYPE element, which defines the way in which the text string is to fit the box, is only defined and permitted in Version 3 and Version 4 metafiles."

Subclause 4.7.5, page 87:

Change the last sentence of the 1st paragraph to read:

"All of these modes are permitted in Version 3 and Version 4 metafiles."

Subclause 4.7.6, page 89:

Change the last sentence on the page to read:

"COLOUR TABLE may appear in the picture body for metafiles of Version 1, 2, 3, and 4, as well as in the Picture Descriptor for Version 2, 3, and 4 metafiles."

4.11 Metafile states

Subclause 4.11, page 102:

Replace the 1st sentence in the next to the last paragraph with the following:

"The states in which each element is allowed for Version 1, Version 2, Version 3, and Version 4 metafiles are described in table 8."

Subclause 4.11, Table 8, pages 103 through 110:

Replace Table 8 with the following:

4.11 Metafile states

Subclause 4.11, page 102:

Replace the 1st sentence in the next to the last paragraph with the following:

"The states in which each element is allowed for Version 1, Version 2, Version 3, and Version 4 metafiles are described in table 8."

Subclause 4.11, Table 8, pages 103 through 110:

Replace Table 8 with the following:

" **Table 8 — CGM Elements by their allowed states**

CGM Element	ver (1)	CGM Major States								
		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
BEGIN METAFILE (4)	1									
END METAFILE	1	X	X							
BEGIN PICTURE	1	X	X							
BEGIN PICTURE BODY	1					X				
END PICTURE	1						X			
BEGIN SEGMENT(7), v2	2		X				X			X
BEGIN SEGMENT, v3/4	2		X			X	X			X
END SEGMENT	2				X			X		
BEGIN FIGURE	2				X		X	X		X
END FIGURE	2									
BEGIN PROTECTION REGION	3				X		X	X		X
END PROTECTION REGION	3									
BEGIN COMPOUND LINE	3				X		X	X		X
END COMPOUND LINE	3									
BEGIN COMPOUND TEXT PATH	3				X		X	X		X
END COMPOUND TEXT PATH	3									
BEGIN TILE ARRAY	3						X			X
END TILE ARRAY	3									
BEGIN APPLICATION STRUCTURE	4						X			X
BEGIN APPLICATION STRUCTURE BODY	4								X	
END APPLICATION STRUCTURE	4									X
METAFILE VERSION	1		X							
METAFILE DESCRIPTION	1		X							
VDC TYPE	1		X							
INTEGER PRECISION	1		X							
REAL PRECISION	1		X							
INDEX PRECISION	1		X							
COLOUR PRECISION	1		X							
COLOUR INDEX PRECISION	1		X							
MAXIMUM COLOUR INDEX	1		X							
COLOUR VALUE EXTENT	1		X							
METAFILE ELEMENT LIST	1		X							
METAFILE DEFAULTS REPLACEMENT	1		X							
FONT LIST	1		X							
CHARACTER SET LIST	1		X							
CHARACTER CODING ANNOUNCER	1		X							
NAME PRECISION	2		X							
MAXIMUM VDC EXTENT	2		X							
SEGMENT PRIORITY EXTENT	2		X							
COLOUR MODEL	3		X							
COLOUR CALIBRATION	3		X							
FONT PROPERTIES	3		X							
GLYPH MAPPING	3		X							
SYMBOL LIBRARY LIST	3		X							
PICTURE DIRECTORY	4		X							

Table 8 — CGM Elements by their allowed states (continued)

CGM Element	ver (1)	CGM Major States								
		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
SCALING MODE	1			X		X				
COLOUR SELECTION MODE(7), v1	1			X		X				
COLOUR SELECTION MODE, v2/3/4	1			X	X	X	X	X		X
LINE WIDTH SPECIFICATION MODE(7), v1	1			X		X				
LINE WIDTH SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
MARKER SIZE SPECIFICATION MODE(7), v1	1			X		X				
MARKER SIZE SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
EDGE WIDTH SPECIFICATION MODE(7), v1	1			X		X				
EDGE WIDTH SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
VDC EXTENT	1			X		X				
BACKGROUND COLOUR	1			X		X				
DEVICE VIEWPORT	2			X		X				
DEVICE VIEWPORT MAPPING	2			X		X				
DEVICE VIEWPORT SPECIFICATION MODE	2			X		X				
LINE REPRESENTATION	2			X		X				
MARKER REPRESENTATION	2			X		X				
TEXT REPRESENTATION	2			X		X				
FILL REPRESENTATION	2			X		X				
EDGE REPRESENTATION	2			X		X				
INTERIOR STYLE SPECIFICATION MODE	3			X	X	X	X	X		X
LINE AND EDGE TYPE DEFINITION	3			X		X				
HATCH STYLE DEFINITION	3			X		X				
GEOMETRIC PATTERN DEFINITION	3			X		X				
APPLICATION STRUCTURE DIRECTORY	4					X				
VDC INTEGER PRECISION	1			X	X		X	X		X
VDC REAL PRECISION	1			X	X		X	X		X
AUXILIARY COLOUR	1			X	X		X	X		X
TRANSPARENCY	1			X	X		X	X		X
CLIP RECTANGLE	1			X	X		X	X		X
CLIP INDICATOR	1			X	X		X	X		X
LINE CLIPPING MODE	2			X	X		X	X		X
MARKER CLIPPING MODE	2			X	X		X	X		X
EDGE CLIPPING MODE	2			X	X		X	X		X
NEW REGION	2									
SAVE PRIMITIVE CONTEXT	2				X		X	X		X
RESTORE PRIMITIVE CONTEXT	2				X		X	X		X
PROTECTION REGION INDICATOR	3			X	X		X	X		X
GENERALIZED TEXT PATH MODE	3			X	X		X	X		X
MITRE LIMIT	3			X	X		X	X		X
TRANSPARENT CELL COLOUR	3			X	X	X	X	X		X

Table 8 — CGM Elements by their allowed states (continued)

CGM Element	ver (1)	CGM Major States								
		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
SCALING MODE	1			X		X				
COLOUR SELECTION MODE(7), v1	1			X		X				
COLOUR SELECTION MODE, v2/3/4	1			X	X	X	X	X		X
LINE WIDTH SPECIFICATION MODE(7), v1	1			X		X				
LINE WIDTH SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
MARKER SIZE SPECIFICATION MODE(7), v1	1			X		X				
MARKER SIZE SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
EDGE WIDTH SPECIFICATION MODE(7), v1	1			X		X				
EDGE WIDTH SPECIFICATION MODE, v2/3/4	1			X	X	X	X	X		X
VDC EXTENT	1			X		X				
BACKGROUND COLOUR	1			X		X				
DEVICE VIEWPORT	2			X		X				
DEVICE VIEWPORT MAPPING	2			X		X				
DEVICE VIEWPORT SPECIFICATION MODE	2			X		X				
LINE REPRESENTATION	2			X		X				
MARKER REPRESENTATION	2			X		X				
TEXT REPRESENTATION	2			X		X				
FILL REPRESENTATION	2			X		X				
EDGE REPRESENTATION	2			X		X				
INTERIOR STYLE SPECIFICATION MODE	3			X	X	X	X	X		X
LINE AND EDGE TYPE DEFINITION	3			X		X				
HATCH STYLE DEFINITION	3			X		X				
GEOMETRIC PATTERN DEFINITION	3			X		X				
APPLICATION STRUCTURE DIRECTORY	4					X				
VDC INTEGER PRECISION	1			X	X		X	X		X
VDC REAL PRECISION	1			X	X		X	X		X
AUXILIARY COLOUR	1			X	X		X	X		X
TRANSPARENCY	1			X	X		X	X		X
CLIP RECTANGLE	1			X	X		X	X		X
CLIP INDICATOR	1			X	X		X	X		X
LINE CLIPPING MODE	2			X	X		X	X		X
MARKER CLIPPING MODE	2			X	X		X	X		X
EDGE CLIPPING MODE	2			X	X		X	X		X
NEW REGION	2									
SAVE PRIMITIVE CONTEXT	2				X		X	X		X
RESTORE PRIMITIVE CONTEXT	2				X		X	X		X
PROTECTION REGION INDICATOR	3			X	X		X	X		X
GENERALIZED TEXT PATH MODE	3			X	X		X	X		X
MITRE LIMIT	3			X	X		X	X		X
TRANSPARENT CELL COLOUR	3			X	X	X	X	X		X

Table 8 — CGM Elements by their allowed states (continued)

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		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
POLYLINE	1				X		X	X		X
DISJOINT POLYLINE	1				X		X	X		X
POLYMARKER	1				X		X	X		X
TEXT	1				X		X	X		X
RESTRICTED TEXT	1				X		X	X		X
APPEND TEXT	1									
POLYGON	1				X		X	X		X
POLYGON SET	1				X		X	X		X
CELL ARRAY	1				X		X	X		X
GDP	1				X		X	X		X
RECTANGLE	1				X		X	X		X
CIRCLE	1				X		X	X		X
CIRCULAR ARC 3 POINT	1				X		X	X		X
CIRCULAR ARC 3 POINT CLOSE	1				X		X	X		X
CIRCULAR ARC CENTRE	1				X		X	X		X
CIRCULAR ARC CENTRE CLOSE	1				X		X	X		X
ELLIPSE	1				X		X	X		X
ELLIPTICAL ARC	1				X		X	X		X
ELLIPTICAL ARC CLOSE	1				X		X	X		X
CIRCULAR ARC CENTRE REVERSED	2				X		X	X		X
CONNECTING EDGE	2									
HYPERBOLIC ARC	3				X		X	X		X
PARABOLIC ARC	3				X		X	X		X
NON-UNIFORM B-SPLINE	3				X		X	X		X
NON-UNIFORM RATIONAL B-SPLINE	3				X		X	X		X
POLYBEZIER	3				X		X	X		X
POLYSYMBOL	3				X		X	X		X
BITONAL TILE	3									
TILE	3									
LINE BUNDLE INDEX	1			X	X		X	X		X
LINE TYPE	1			X	X		X	X		X
LINE WIDTH	1			X	X		X	X		X
LINE COLOUR	1			X	X		X	X		X
MARKER BUNDLE INDEX	1			X	X		X	X		X
MARKER TYPE	1			X	X		X	X		X
MARKER SIZE	1			X	X		X	X		X
MARKER COLOUR	1			X	X		X	X		X
TEXT BUNDLE INDEX	1			X	X		X	X		X
TEXT FONT INDEX	1			X	X		X	X		X
TEXT PRECISION	1			X	X		X	X		X
CHARACTER EXPANSION FACTOR	1			X	X		X	X		X
CHARACTER SPACING	1			X	X		X	X		X
TEXT COLOUR	1			X	X		X	X		X
CHARACTER HEIGHT	1			X	X		X	X		X
CHARACTER ORIENTATION	1			X	X		X	X		X

Table 8 — CGM Elements by their allowed states (continued)

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		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
TEXT PATH	1			X	X		X	X		X
TEXT ALIGNMENT	1			X	X		X	X		X
CHARACTER SET INDEX	1			X	X		X	X		X
ALTERNATE CHARACTER SET INDEX	1			X	X		X	X		X
FILL BUNDLE INDEX	1			X	X		X	X		X
INTERIOR STYLE	1			X	X		X	X		X
FILL COLOUR	1			X	X		X	X		X
HATCH INDEX	1			X	X		X	X		X
PATTERN INDEX	1			X	X		X	X		X
EDGE BUNDLE INDEX	1			X	X		X	X		X
EDGE TYPE	1			X	X		X	X		X
EDGE WIDTH	1			X	X		X	X		X
EDGE COLOUR	1			X	X		X	X		X
EDGE VISIBILITY	1			X	X		X	X		X
FILL REFERENCE POINT	1			X	X		X	X		X
PATTERN TABLE(7), v1	1			X			X			X
PATTERN TABLE, v2/3/4	1			X		X	X			X
COLOUR TABLE(7), v1	1			X			X			X
COLOUR TABLE, v2/3/4	1			X		X	X			X
ASPECT SOURCE FLAGS	1			X	X		X	X		X
PICK IDENTIFIER	2			X	X		X	X		X
LINE CAP	3			X	X		X	X		X
LINE JOIN	3			X	X		X	X		X
LINE TYPE CONTINUATION	3			X	X		X	X		X
LINE TYPE INITIAL OFFSET	3			X	X		X	X		X
TEXT SCORE TYPE	3			X	X		X	X		X
RESTRICTED TEXT TYPE	3			X	X		X	X		X
INTERPOLATED INTERIOR	3			X	X		X	X		X
EDGE CAP	3			X	X		X	X		X
EDGE JOIN	3			X	X		X	X		X
EDGE TYPE CONTINUATION	3			X	X		X	X		X
EDGE TYPE INITIAL OFFSET	3			X	X		X	X		X
SYMBOL LIBRARY INDEX	3			X	X		X	X		X
SYMBOL COLOUR	3			X	X		X	X		X
SYMBOL SIZE	3			X	X		X	X		X
SYMBOL ORIENTATION	3			X	X		X	X		X
ESCAPE	1	X	X	X	X	X	X	X		X
MESSAGE	1	X	X	X	X	X	X	X		X
APPLICATION DATA	1	X	X	X	X	X	X	X		X
APPLICATION STRUCTURE ATTRIBUTE	4								X	
COPY SEGMENT	2				X		X	X		X
INHERITANCE FILTER	2			X	X		X	X		X
CLIP INHERITANCE	2			X	X		X	X		X
SEGMENT TRANSFORMATION	2			X	X			X		
SEGMENT HIGHLIGHTING	2			X	X			X		
SEGMENT DISPLAY PRIORITY	2			X	X			X		
SEGMENT PICK PRIORITY	2			X	X			X		

Table 8 — CGM Elements by their allowed states (continued)

CGM Element	ver (1)	CGM Major States								
		PCS	MDS	DR (3)	GSS, DSS	PDS	POS	LSS	SDS	SOS
		v1(2)	v1	v1	v2	v1	v1	v2	v4	v4
TEXT PATH	1			X	X		X	X		X
TEXT ALIGNMENT	1			X	X		X	X		X
CHARACTER SET INDEX	1			X	X		X	X		X
ALTERNATE CHARACTER SET INDEX	1			X	X		X	X		X
FILL BUNDLE INDEX	1			X	X		X	X		X
INTERIOR STYLE	1			X	X		X	X		X
FILL COLOUR	1			X	X		X	X		X
HATCH INDEX	1			X	X		X	X		X
PATTERN INDEX	1			X	X		X	X		X
EDGE BUNDLE INDEX	1			X	X		X	X		X
EDGE TYPE	1			X	X		X	X		X
EDGE WIDTH	1			X	X		X	X		X
EDGE COLOUR	1			X	X		X	X		X
EDGE VISIBILITY	1			X	X		X	X		X
FILL REFERENCE POINT	1			X	X		X	X		X
PATTERN TABLE(7), v1	1			X			X			X
PATTERN TABLE, v2/3/4	1			X		X	X			X
COLOUR TABLE(7), v1	1			X			X			X
COLOUR TABLE, v2/3/4	1			X		X	X			X
ASPECT SOURCE FLAGS	1			X	X		X	X		X
PICK IDENTIFIER	2			X	X		X	X		X
LINE CAP	3			X	X		X	X		X
LINE JOIN	3			X	X		X	X		X
LINE TYPE CONTINUATION	3			X	X		X	X		X
LINE TYPE INITIAL OFFSET	3			X	X		X	X		X
TEXT SCORE TYPE	3			X	X		X	X		X
RESTRICTED TEXT TYPE	3			X	X		X	X		X
INTERPOLATED INTERIOR	3			X	X		X	X		X
EDGE CAP	3			X	X		X	X		X
EDGE JOIN	3			X	X		X	X		X
EDGE TYPE CONTINUATION	3			X	X		X	X		X
EDGE TYPE INITIAL OFFSET	3			X	X		X	X		X
SYMBOL LIBRARY INDEX	3			X	X		X	X		X
SYMBOL COLOUR	3			X	X		X	X		X
SYMBOL SIZE	3			X	X		X	X		X
SYMBOL ORIENTATION	3			X	X		X	X		X
ESCAPE	1	X	X	X	X	X	X	X		X
MESSAGE	1	X	X	X	X	X	X	X		X
APPLICATION DATA	1	X	X	X	X	X	X	X		X
APPLICATION STRUCTURE ATTRIBUTE	4								X	
COPY SEGMENT	2				X		X	X		X
INHERITANCE FILTER	2			X	X		X	X		X
CLIP INHERITANCE	2			X	X		X	X		X
SEGMENT TRANSFORMATION	2			X	X			X		
SEGMENT HIGHLIGHTING	2			X	X			X		
SEGMENT DISPLAY PRIORITY	2			X	X			X		
SEGMENT PICK PRIORITY	2			X	X			X		

Table 8 — CGM Elements by their allowed states (continued)

	CGM Minor States				
CGM Element	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
BEGIN METAFILE END METAFILE BEGIN PICTURE BEGIN PICTURE BODY END PICTURE					
BEGIN SEGMENT END SEGMENT BEGIN FIGURE END FIGURE BEGIN PROTECTION REGION	X				
END PROTECTION REGION BEGIN COMPOUND LINE END COMPOUND LINE BEGIN COMPOUND TEXT PATH END COMPOUND TEXT PATH			X(5) X(6)	X	
BEGIN TILE ARRAY END TILE ARRAY BEGIN APPLICATION STRUCTURE BEGIN APPLICATION STRUCTURE BODY END APPLICATION STRUCTURE METAFILE VERSION METAFILE DESCRIPTION VDC TYPE					X
INTEGER PRECISION REAL PRECISION INDEX PRECISION COLOUR PRECISION COLOUR INDEX PRECISION					
MAXIMUM COLOUR INDEX COLOUR VALUE EXTENT METAFILE ELEMENT LIST METAFILE DEFAULTS REPLACEMENT FONT LIST					
CHARACTER SET LIST CHARACTER CODING ANNOUNCER NAME PRECISION MAXIMUM VDC EXTENT SEGMENT PRIORITY EXTENT					
COLOUR MODEL COLOUR CALIBRATION FONT PROPERTIES GLYPH MAPPING SYMBOL LIBRARY LIST PICTURE DIRECTORY					

Table 8 — CGM Elements by their allowed states (continued)

CGM Element	CGM Minor States				
	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
SCALING MODE COLOUR SELECTION MODE LINE WIDTH SPECIFICATION MODE MARKER SIZE SPECIFICATION MODE EDGE WIDTH SPECIFICATION MODE					
VDC EXTENT BACKGROUND COLOUR DEVICE VIEWPORT DEVICE VIEWPORT MAPPING DEVICE VIEWPORT SPECIFICATION MODE					
LINE REPRESENTATION MARKER REPRESENTATION TEXT REPRESENTATION FILL REPRESENTATION EDGE REPRESENTATION					
INTERIOR STYLE SPECIFICATION MODE LINE AND EDGE TYPE DEFINITION HATCH STYLE DEFINITION GEOMETRIC PATTERN DEFINITION APPLICATION STRUCTURE DIRECTORY VDC INTEGER PRECISION	X		X	X	
VDC REAL PRECISION AUXILIARY COLOUR TRANSPARENCY CLIP RECTANGLE CLIP INDICATOR	X X X	 X X	X	X	
LINE CLIPPING MODE MARKER CLIPPING MODE EDGE CLIPPING MODE NEW REGION SAVE PRIMITIVE CONTEXT	X			X	
RESTORE PRIMITIVE CONTEXT PROTECTION REGION INDICATOR GENERALIZED TEXT PATH MODE MITRE LIMIT TRANSPARENT CELL COLOUR					

Table 8 — CGM Elements by their allowed states (continued)

	CGM Minor States				
CGM Element	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
SCALING MODE COLOUR SELECTION MODE LINE WIDTH SPECIFICATION MODE MARKER SIZE SPECIFICATION MODE EDGE WIDTH SPECIFICATION MODE					
VDC EXTENT BACKGROUND COLOUR DEVICE VIEWPORT DEVICE VIEWPORT MAPPING DEVICE VIEWPORT SPECIFICATION MODE					
LINE REPRESENTATION MARKER REPRESENTATION TEXT REPRESENTATION FILL REPRESENTATION EDGE REPRESENTATION					
INTERIOR STYLE SPECIFICATION MODE LINE AND EDGE TYPE DEFINITION HATCH STYLE DEFINITION GEOMETRIC PATTERN DEFINITION APPLICATION STRUCTURE DIRECTORY VDC INTEGER PRECISION	X		X	X	
VDC REAL PRECISION AUXILIARY COLOUR TRANSPARENCY CLIP RECTANGLE CLIP INDICATOR	X X X	 X X	X	X	
LINE CLIPPING MODE MARKER CLIPPING MODE EDGE CLIPPING MODE NEW REGION SAVE PRIMITIVE CONTEXT	X			X	
RESTORE PRIMITIVE CONTEXT PROTECTION REGION INDICATOR GENERALIZED TEXT PATH MODE MITRE LIMIT TRANSPARENT CELL COLOUR					

Table 8 — CGM Elements by their allowed states (continued)

CGM Element	CGM Minor States				
	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
POLYLINE	X		X	X	
DISJOINT POLYLINE	X		X	X	
POLYMARKER					
TEXT					
RESTRICTED TEXT					
APPEND TEXT		X			
POLYGON	X			X	
POLYGON SET	X			X	
CELL ARRAY					
GDP	X		X	X	
RECTANGLE	X			X	
CIRCLE	X			X	
CIRCULAR ARC 3 POINT	X		X	X	
CIRCULAR ARC 3 POINT CLOSE	X			X	
CIRCULAR ARC CENTRE	X		X	X	
CIRCULAR ARC CENTRE CLOSE	X			X	
ELLIPSE	X			X	
ELLIPTICAL ARC	X		X	X	
ELLIPTICAL ARC CLOSE	X			X	
CIRCULAR ARC CENTRE REVERSED	X		X	X	
CONNECTING EDGE	X				
HYPERBOLIC ARC	X		X	X	
PARABOLIC ARC	X		X	X	
NON-UNIFORM B-SPLINE	X		X	X	
NON-UNIFORM RATIONAL B-SPLINE	X		X	X	
POLYBEZIER	X		X	X	
POLYSYMBOL					
BITONAL TILE					X
TILE					X
LINE BUNDLE INDEX					
LINE TYPE					
LINE WIDTH					
LINE COLOUR					
MARKER BUNDLE INDEX					
MARKER TYPE					
MARKER SIZE					
MARKER COLOUR					
TEXT BUNDLE INDEX		X			
TEXT FONT INDEX		X			
TEXT PRECISION		X			
CHARACTER EXPANSION FACTOR		X			
CHARACTER SPACING		X			
TEXT COLOUR		X			
CHARACTER HEIGHT		X			
CHARACTER ORIENTATION					

Table 8 — CGM Elements by their allowed states (concluded)

CGM Element	CGM Minor States				
	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
TEXT PATH					
TEXT ALIGNMENT					
CHARACTER SET INDEX		X			
ALTERNATE CHARACTER SET INDEX		X			
FILL BUNDLE INDEX					
INTERIOR STYLE					
FILL COLOUR					
HATCH INDEX					
PATTERN INDEX					
EDGE BUNDLE INDEX	X				
EDGE TYPE	X				
EDGE WIDTH	X				
EDGE COLOUR	X				
EDGE VISIBILITY	X				
FILL REFERENCE POINT					
PATTERN TABLE					
COLOUR TABLE					
ASPECT SOURCE FLAGS	X				
PICK IDENTIFIER					
LINE CAP					
LINE JOIN					
LINE TYPE CONTINUATION					
LINE TYPE INITIAL OFFSET					
TEXT SCORE TYPE		X			
RESTRICTED TEXT TYPE					
INTERPOLATED INTERIOR					
EDGE CAP					
EDGE JOIN					
EDGE TYPE CONTINUATION					
EDGE TYPE INITIAL OFFSET					
SYMBOL LIBRARY INDEX					
SYMBOL COLOUR					
SYMBOL SIZE					
SYMBOL ORIENTATION					
ESCAPE	X	X	X	X	X
MESSAGE	X		X	X	X
APPLICATION DATA	X		X	X	X
APPLICATION STRUCTURE ATTRIBUTE					
COPY SEGMENT					
INHERITANCE FILTER					
CLIP INHERITANCE					
SEGMENT TRANSFORMATION					
SEGMENT HIGHLIGHTING					
SEGMENT DISPLAY PRIORITY					
SEGMENT PICK PRIORITY					

Table 8 — CGM Elements by their allowed states (concluded)

	CGM Minor States				
CGM Element	FOS v2	TOS v1	CPS v3	PRS v3	TAS v3
TEXT PATH					
TEXT ALIGNMENT					
CHARACTER SET INDEX		X			
ALTERNATE CHARACTER SET INDEX		X			
FILL BUNDLE INDEX					
INTERIOR STYLE					
FILL COLOUR					
HATCH INDEX					
PATTERN INDEX					
EDGE BUNDLE INDEX	X				
EDGE TYPE	X				
EDGE WIDTH	X				
EDGE COLOUR	X				
EDGE VISIBILITY	X				
FILL REFERENCE POINT					
PATTERN TABLE					
COLOUR TABLE					
ASPECT SOURCE FLAGS	X				
PICK IDENTIFIER					
LINE CAP					
LINE JOIN					
LINE TYPE CONTINUATION					
LINE TYPE INITIAL OFFSET					
TEXT SCORE TYPE		X			
RESTRICTED TEXT TYPE					
INTERPOLATED INTERIOR					
EDGE CAP					
EDGE JOIN					
EDGE TYPE CONTINUATION					
EDGE TYPE INITIAL OFFSET					
SYMBOL LIBRARY INDEX					
SYMBOL COLOUR					
SYMBOL SIZE					
SYMBOL ORIENTATION					
ESCAPE	X	X	X	X	X
MESSAGE	X		X	X	X
APPLICATION DATA	X		X	X	X
APPLICATION STRUCTURE ATTRIBUTE					
COPY SEGMENT					
INHERITANCE FILTER					
CLIP INHERITANCE					
SEGMENT TRANSFORMATION					
SEGMENT HIGHLIGHTING					
SEGMENT DISPLAY PRIORITY					
SEGMENT PICK PRIORITY					

"

Subclause 4.11, page 110:

Replace Note 2 at the bottom of the page with the following:

"2. These entries define the lowest metafile version for which this state is defined. Therefore "v1" indicates the state is defined for Version 1 metafiles (hence also for Version 2, Version 3, and all higher version metafiles); "v2" indicates that the state is defined for Version 2 metafiles (hence also for Version 3 and all higher version metafiles); "vn" indicates that the state is defined for Version n metafiles (hence also for any higher version metafiles)."

Subclause 4.11, page 111:

Change the 2nd sentence of Note 7 to read:

"For example, COLOUR TABLE is not allowed in the picture body in Version 1 metafiles, but it is allowed in the picture body in Version 2, Version 3, and Version 4 metafiles."

Subclause 4.11, page 111:

Add the following two items at the end of the Major States list after the LSS state:

"SDS Application Structure Descriptor State
SOS Application Structure Open State"

Subclause 4.11, page 112:

Replace Table 9 with the following.

"

Element	Original state	Final state
BEGIN FIGURE	GSS,LSS,POS,SOS	FOS
END FIGURE	FOS	previous state
TEXT (not-final)	GSS,LSS,POS,SOS	TOS
RESTRICTED TEXT (not-final)	GSS,LSS,POS,SOS	TOS
APPEND TEXT (final)	TOS	previous state
BEGIN COMPOUND LINE	GSS,LSS,POS,SOS	CPS
END COMPOUND LINE	CPS	previous state
BEGIN COMPOUND TEXT PATH	GSS,LSS,POS,SOS	CPS
END COMPOUND TEXT PATH	CPS	previous state
BEGIN PROTECTED REGION	GSS,LSS,POS,SOS	PRS
END PROTECTED REGION	PRS	previous state
BEGIN TILE ARRAY	POS,SOS	TAS
END TILE ARRAY	TAS	previous state

"

4.12 Registration

Subclause 4.12, page 112:

Add the following elements to the list of elements affected by registration of graphical items:

"BEGIN APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE"

Add the following sentence after the last sentence, page 112:

"A template will be required for BEGIN APPLICATION STRUCTURE and APPLICATION STRUCTURE ATTRIBUTE which describes the particular registered usage of the elements."

Add the following new Subclause 4.13 after Subclause 4.12 page 112:

"**4.13 Application Structure Elements**

4.13.1 Introduction

Application structures (APS), which provide access to metafiles for applications such as text/graphics integration at levels of granularity finer than the picture level, may be defined in Version 4 metafiles. An APS is defined within a picture body as follows:

BEGIN APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE
.
.(Arbitrary number of application structure attributes)
.
BEGIN APPLICATION STRUCTURE BODY
.
.(Graphic primitives, attributes, and control elements in any order)
.
END APPLICATION STRUCTURE

The BEGIN APPLICATION STRUCTURE element has three parameters which define the type, unique indentifier, and inheritance mechanism for the APS. The APPLICATION STRUCTURE ATTRIBUTE provides the capability for applications to associate non-graphical information with APSs. This element has two parameters which define the type of APS attribute, and the data record containing the actual data.

APSs defined in this manner enable applications to structure and manage the metafile in a manner meaningful to the application.

4.13.2 Location of and access to Application Structures

One or more APSs may occur within a picture body, or totally within another APS. APSs may be classified into classes or categories meaningful to a particular application by using the application structure type parameter. An APS shall be uniquely identified (using the application structure identifier) within the metafile. An APS may occur only within a picture body but may not occur within a local segment. However, an APS may contain local segments as long as the segments begin and end within the APS body.

4.13.3 Nesting of Application Structures

Application structures may be nested to any level as long as a nested APS is contained completely within the APS in which it is contained.

4.13.4 Graphical Context of Application Structures

"BEGIN APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE"

Add the following sentence after the last sentence, page 112:

"A template will be required for BEGIN APPLICATION STRUCTURE and APPLICATION STRUCTURE ATTRIBUTE which describes the particular registered usage of the elements."

Add the following new Subclause 4.13 after Subclause 4.12 page 112:

"4.13 Application Structure Elements

4.13.1 Introduction

Application structures (APS), which provide access to metafiles for applications such as text/graphics integration at levels of granularity finer than the picture level, may be defined in Version 4 metafiles. An APS is defined within a picture body as follows:

BEGIN APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE
.
.(Arbitrary number of application structure attributes)
.
BEGIN APPLICATION STRUCTURE BODY
.
.(Graphic primitives, attributes, and control elements in any order)
.
END APPLICATION STRUCTURE

The BEGIN APPLICATION STRUCTURE element has three parameters which define the type, unique indentifier, and inheritance mechanism for the APS. The APPLICATION STRUCTURE ATTRIBUTE provides the capability for applications to associate non-graphical information with APSs. This element has two parameters which define the type of APS attribute, and the data record containing the actual data.

APSs defined in this manner enable applications to structure and manage the metafile in a manner meaningful to the application.

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One or more APSs may occur within a picture body, or totally within another APS. APSs may be classified into classes or categories meaningful to a particular application by using the application structure type parameter. An APS shall be uniquely identified (using the application structure identifier) within the metafile. An APS may occur only within a picture body but may not occur within a local segment. However, an APS may contain local segments as long as the segments begin and end within the APS body.

4.13.3 Nesting of Application Structures

Application structures may be nested to any level as long as a nested APS is contained completely within the APS in which it is contained.

4.13.4 Graphical Context of Application Structures

The graphic primitive context at the beginning of an APS is determined by the value of the inheritance flag parameter of the BEGIN APPLICATION STRUCTURE element. If the value is 'statelist', the APS inherits the current graphic primitive context (context-dependent). If it is 'application structure' the graphic primitive context is reset to the state at the beginning of the picture body (context-independent) in which the APS is defined. At the time its END APPLICATION STRUCTURE element is encountered, a context-independent APS automatically restores the graphic primitive context to the state which existed at the time its BEGIN APPLICATION STRUCTURE element was encountered. The END APPLICATION STRUCTURE element of a context-dependent APS has no effect on the graphic primitive context.

4.13.5 Application Structure Attributes

The APPLICATION STRUCTURE ATTRIBUTE element describes and defines the behaviour of application structures. One or more of these elements may occur immediately after a BEGIN APPLICATION STRUCTURE element and before its corresponding BEGIN APPLICATION STRUCTURE BODY element. APPLICATION STRUCTURE ATTRIBUTE elements may not occur elsewhere in a metafile. The application structure attribute type may be used to classify the information stored in the attribute's structured data record. The value of the application structure attribute type need not be unique. The values are intended to provide important information to the application before it parses the information in the structured data record. The value of the application structure attribute type and the structured data record are unrestricted. It is anticipated that application constituencies will specify the content and structure of the information in the application structure attributes in a profile. APPLICATION STRUCTURE ATTRIBUTE elements are the only elements that shall occur between the BEGIN APPLICATION STRUCTURE element and its corresponding BEGIN APPLICATION STRUCTURE BODY element.

4.13.6 Relationship between application structures and segments

An application structure shall occur only within a picture body but not within the definition of a local segment. Therefore, an application structure cannot occur within either global or local segment definitions, regardless of where the segments are defined. Copy segment elements may occur within application structures. These copy segment elements may reference either local or global segments. However, a COPY SEGMENT element which occurs within a context independent APS (inheritance flag value of 'application structure') shall only reference segments defined within the metafile descriptor or the picture descriptor. COPY SEGMENT elements within a context independent APS shall not reference segments defined in the picture body.

When a segment is referenced from within an application structure using the COPY SEGMENT element, the graphical context used to render the segment depends on the value of the inheritance flag parameter of the BEGIN APPLICATION STRUCTURE element, the values of the filter selection list parameter of the INHERITANCE FILTER element, and the value of the clip inheritance parameter of the CLIP INHERITANCE element. The graphical context for rendering segments referenced from within an application structure are shown in the following table:

APS inheritance flag	segment inheritance	segment graphical context
state list	state list	context at COPY SEGMENT
application structure	state list	context at COPY SEGMENT
state list	segment	context at segment definition
application structure	segment	context at segment definition

"

5 *Abstract specification of elements*

5.1 *Introduction*

Subclause 5.1, page 116:

Add to Table 10 - Data type definitions and abbreviations after UI8:

"

UI16	16-bit Unsigned Integer	An unsigned integer in the range 0..(2**16 - 1), represented in each of the encodings with a precision equivalent to 16 binary bits.

"

5.2 *Delimiter elements*

Add new Subclauses 5.2.18, 5.2.19, and 5.2.20, page 126:

"**5.2.18 BEGIN APPLICATION STRUCTURE**

parameters:

application structure identifier (SF)
application structure type (SF)
inheritance flag (one of: statelist, application structure) (E)

Description:

This is the first element of an application structure. All subsequent elements until the matching END APPLICATION STRUCTURE element belong to this application structure. The Application Structure Identifier is available for use by generators and interpreters in a manner that is not standardized except that this identifier shall uniquely identify the application structure within the scope of the metafile. The Application Structure Type is available for classifying APSs into groups meaningful to the application. There are no restrictions on the values of this parameter.

The inheritance flag parameter determines the graphic primitive context in which the elements between the BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE elements will be realized. If the value of the inheritance flag parameter is 'state list', then the application structure will inherit the graphic primitive context that is current within the metafile and the END APPLICATION STRUCTURE element that completes the application structure definition will have no effect on the graphic primitive context. If the inheritance flag is 'application structure', the current graphical primitive context will be suspended and replaced by the context at the BEGIN PICTURE BODY element of the picture in which the APS occurs. The suspended context will be restored at the END APPLICATION STRUCTURE element that completes the application structure definition.

References:
4.2

5.2.19 BEGIN APPLICATION STRUCTURE BODY

Parameters:

5 *Abstract specification of elements*

5.1 *Introduction*

Subclause 5.1, page 116:

Add to Table 10 - Data type definitions and abbreviations after UI8:

"

UI16	16-bit Unsigned Integer	An unsigned integer in the range 0..(2**16 - 1), represented in each of the encodings with a precision equivalent to 16 binary bits.

"

5.2 *Delimiter elements*

Add new Subclauses 5.2.18, 5.2.19, and 5.2.20, page 126:

"5.2.18 BEGIN APPLICATION STRUCTURE

parameters:

application structure identifier (SF)
application structure type (SF)
inheritance flag (one of: statelist, application structure) (E)

Description:

This is the first element of an application structure. All subsequent elements until the matching END APPLICATION STRUCTURE element belong to this application structure. The Application Structure Identifier is available for use by generators and interpreters in a manner that is not standardized except that this identifier shall uniquely identify the application structure within the scope of the metafile. The Application Structure Type is available for classifying APSs into groups meaningful to the application. There are no restrictions on the values of this parameter.

The inheritance flag parameter determines the graphic primitive context in which the elements between the BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE elements will be realized. If the value of the inheritance flag parameter is 'state list', then the application structure will inherit the graphic primitive context that is current within the metafile and the END APPLICATION STRUCTURE element that completes the application structure definition will have no effect on the graphic primitive context. If the inheritance flag is 'application structure', the current graphical primitive context will be suspended and replaced by the context at the BEGIN PICTURE BODY element of the picture in which the APS occurs. The suspended context will be restored at the END APPLICATION STRUCTURE element that completes the application structure definition.

References:
4.2

5.2.19 BEGIN APPLICATION STRUCTURE BODY

Parameters:

None

Description:

This element demarcates the application structure attributes and the beginning of the graphical primitives in the application structure. It thus informs the metafile interpreter of the transition from the application structure attributes to the graphical primitive, attribute, and control elements that define the application structure.

References:
4.2

5.2.20 END APPLICATION STRUCTURE

Parameters:

None

Description:

This is the last element of an application structure. Subsequent elements will not belong to this application structure. At the time this element is encountered, the graphic primitive context is automatically restored to the state which existed at the time the corresponding BEGIN APPLICATION STRUCTURE element was encountered if the inheritance flag parameter of the BEGIN APPLICATION STRUCTURE was set to 'application structure' . If the inheritance flag parameter was set to 'state list' the END APPLICATION STRUCTURE element has no effect on the graphic primitive context.

References:
4.2"

5.3 Metafile descriptor elements

Add a new Subclause 5.3.24, page 142:

"5.3.24 PICTURE DIRECTORY

Parameters:

location data type selector (one of: UI8, UI16, UI32) (E)
list of: three-tuples of picture identifier (SF), picture location (ldt), application structure directory location (ldt)

NOTE - ldt is the location data type specified by the location data type selector.

Description:

This element provides an optional directory that is intended to assist the metafile interpreter in accessing a picture contained within the metafile. The two parameters for this element comprise a location parameter data type and a list of picture identifier, picture location, application structure directory location three-tuples. The values of the picture identifier parameter shall correspond

exactly to the values of the picture identifiers in the BEGIN PICTURE elements of the metafile. The values of the picture location parameter are encoding-dependent representations of the number of increments that separate the start of the metafile from the start of the BEGIN PICTURE element of the associated picture. The values of the application structure directory location parameter are encoding-dependent representations of the number of increments that separate the start of the metafile from the start of the APPLICATION STRUCTURE DIRECTORY element of the associated picture. Even if an application structure directory location parameter is 0, an application structure directory may still be present. The location of the start of the metafile is 0.

References:
4.3.2.7
4.3.2.8
4.3.5"

5.4 Picture descriptor elements

Subclause 5.4.2, page 143:

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.3, page 144:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.4, page 144:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.5 page 145:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

exactly to the values of the picture identifiers in the BEGIN PICTURE elements of the metafile. The values of the picture location parameter are encoding-dependent representations of the number of increments that separate the start of the metafile from the start of the BEGIN PICTURE element of the associated picture. The values of the application structure directory location parameter are encoding-dependent representations of the number of increments that separate the start of the metafile from the start of the APPLICATION STRUCTURE DIRECTORY element of the associated picture. Even if an application structure directory location parameter is 0, an application structure directory may still be present. The location of the start of the metafile is 0.

References:
4.3.2.7
4.3.2.8
4.3.5"

5.4 Picture descriptor elements

Subclause 5.4.2, page 143:

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.3, page 144:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.4, page 144:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.5 page 145:

Change the last sentence of the 1st paragraph of the Description to read:

"The modes 'fractional' and 'mm' are only supported in Version 3 and Version 4 metafiles."

Change the last sentence of the 2nd paragraph of the Description to read:

"In Version 2, Version 3, and Version 4 metafiles, this element may appear in the picture body as well as the picture descriptor, and the colour selection mode may therefore be changed within the picture."

Subclause 5.4.14, page 150:

Change the last sentence of the Description to read:

"Interior styles 'geometric pattern' and 'interpolated' shall only be used in Version 3 and Version 4 metafiles."

Subclause 5.4.16, page 151:

Change the last sentence of the Description to read:

"This element shall appear only in Version 3 and Version 4 metafiles."

Add new Subclause 5.4.20, page 154

"5.4.20 APPLICATION STRUCTURE DIRECTORY

Parameters:

location data type selector (one of: UI8, UI16, UI32) (E)
list of: pairs of application structure identifier (SF), application structure location (ldt)

NOTE - ldt is the location data type specified by the location data type selector.

Description:

This element provides an optional directory that is intended to assist the metafile interpreter in accessing the application structures contained within the pictures of the metafile. The two parameters for this element comprise a location parameter data type and a list of application structure identifier and application structure location pairs. The values of the application structure identifier parameter shall correspond exactly to the values of the application structure identifiers in the BEGIN APPLICATION STRUCTURE elements of the picture. The values of the application structure location parameter are encoding-dependent representations of the number of increments that separate the start of the picture from the start of the BEGIN APPLICATION STRUCTURE elements in the picture. The location of the start of the picture is 0.

References:
4.3.2.7
4.3.2.8
4.5.8"

5.6 Graphical primitive elements

Subclause 5.6.3, page 164:

Change the last sentence of the Description to read:

"For Version 2, Version 3 and Version 4 metafiles, the clipping of markers which are partially within the clipping area and partially outside of it is controlled by MARKER CLIPPING MODE as described in 4.5.2 and 4.6.2.3."

Subclause 5.6.5, page 165:

Change the 1st sentence of the 7th paragraph of the Description to read:

"For Version 3 and Version 4 metafiles, the way in which the text string is to fit the box may be controlled by the RESTRICTED TEXT TYPE element."

5.7 Attribute elements

Subclause 5.7.2, page 191:

Change the 1st sentence of Note 1 to read:

"1. Line type continuity is addressed in Version 3 and Version 4 metafiles with the LINE TYPE CONTINUATION ELEMENT."

Subclause 5.7.27, page 204:

Change the 1st sentence of the Notes to read:

"Edge type continuity is addressed in Version 3 and Version 4 metafiles with the EDGE TYPE CONTINUATION ELEMENT."

Add a new Subclause 5.11, page 226:

"5.11 Application structure descriptor elements

5.11.1 APPLICATION STRUCTURE ATTRIBUTE

Parameters:

application structure attribute type (SF)
data record (SDR)

Description:

This element supplements the information in the metafile in an application-specific way. The Application Structure Descriptor section of an application structure comprises zero or more instances of only this element. It is intended that this element provide a mechanism to attach properties to an application structure definition. The application structure attribute type parameter may be used to classify attributes into groups meaningful to the application. The data record values contain application-specific data.

References:
4.13"

"For Version 2, Version 3 and Version 4 metafiles, the clipping of markers which are partially within the clipping area and partially outside of it is controlled by MARKER CLIPPING MODE as described in 4.5.2 and 4.6.2.3."

Subclause 5.6.5, page 165:

Change the 1st sentence of the 7th paragraph of the Description to read:

"For Version 3 and Version 4 metafiles, the way in which the text string is to fit the box may be controlled by the RESTRICTED TEXT TYPE element."

5.7 Attribute elements

Subclause 5.7.2, page 191:

Change the 1st sentence of Note 1 to read:

"1. Line type continuity is addressed in Version 3 and Version 4 metafiles with the LINE TYPE CONTINUATION ELEMENT."

Subclause 5.7.27, page 204:

Change the 1st sentence of the Notes to read:

"Edge type continuity is addressed in Version 3 and Version 4 metafiles with the EDGE TYPE CONTINUATION ELEMENT."

Add a new Subclause 5.11, page 226:

"5.11 Application structure descriptor elements

5.11.1 APPLICATION STRUCTURE ATTRIBUTE

Parameters:

application structure attribute type (SF)
data record (SDR)

Description:

This element supplements the information in the metafile in an application-specific way. The Application Structure Descriptor section of an application structure comprises zero or more instances of only this element. It is intended that this element provide a mechanism to attach properties to an application structure definition. The application structure attribute type parameter may be used to classify attributes into groups meaningful to the application. The data record values contain application-specific data.

References:
4.13"

Editor's Note: The following changes are to be made to Clause 7 as modified by ISO/IEC 8632-1:1992/Amd.1:1994.

7.5.4.6 Non-graphical text strings

Add to the list of Type SF Parameters page 17, ISO/IEC 8632-1:1992/Amd.1:1994:

"BEGIN APPLICATION STRUCTURE
APPLICATION STRUCTURE ATTRIBUTE
PICTURE DIRECTORY
APPLICATION STRUCTURE DIRECTORY"

7.5.4.7 Data record strings

Add to the list of elements affected by this rule, page 17, ISO/IEC 8632-1:1992/Amd.1:1994:

APPLICATION STRUCTURE ATTRIBUTE

7.5.5 Individual element rules

Add the following to Table 15 - Delimiter elements, page 34, ISO/IEC 8632-1:1992/Amd.1:1994:

" Table 15 - Delimiter elements

Element	Specifications - PPF	Specifications - Model Profile
T.15.9 BEGIN APPLICATION STRUCTURE BEGIN APPLICATION STRUCTURE BODY END APPLICATION STRUCTURE [v4] References: 5.2.18 5.2.19 5.2.20	Same as Model Profile ☐ Element is: Required ☐ Permitted ☑ Prohibited ☐ Limits on the maximum number of defined structures within a picture: Limits on the number and identity of elements comprising a structure: Is there any meaning to the application structure identifier parameter? *yes/no* If yes, specify. Is the inheritance flag parameter restricted? *yes/no* Other:	Element is: Required ☐ Permitted ☑ Prohibited ☐ Limits on the maximum number of defined structures within a picture: ***None*** Limits on the number and identity of elements comprising a structure: ***None*** To the application structure identifier parameter, state the meaning: ***Assigned beyond being a unique identifier for the application structure.*** Is the inheritance flag parameter restricted? *yes/no* **no** Other: ***None***

"

" Table 15 - Delimiter elements

Element	Specifications - PPF	Specifications - Model Profile
T.15.9 BEGIN APPLICATION STRUCTURE BEGIN APPLICATION STRUCTURE BODY END APPLICATION STRUCTURE [v4] References: 5.2.18 5.2.19 5.2.20	Same as Model Profile ☐	
	Element is: Required ☐ Permitted ☑ Prohibited ☐ Limits on the maximum number of defined structures within a picture: Limits on the number and identity of elements comprising a structure: Is there any meaning to the application structure identifier parameter? *yes/no* If yes, specify. Is the inheritance flag parameter restricted? *yes/no* Other:	Element is: Required ☐ Permitted ☑ Prohibited ☐ Limits on the maximum number of defined structures within a picture: ***None*** Limits on the number and identity of elements comprising a structure: ***None*** To the application structure identifier parameter, state the meaning: ***Assigned beyond being a unique identifier for the application structure.*** Is the inheritance flag parameter restricted? *yes/no* **no** Other: ***None***

"

Change the 2nd line of the model profile column of entry T.16.1 of Table 16 - Metafile descriptor elements, page 35, ISO/IEC 8632-1:1992/Amd.1:1994:

"Metafile versions are permitted by this profile: 1,2,3,4"

Add the following to Table 16 - Metafile descriptor elements, page 34, ISO/IEC 8632-1:1992/Amd.1:1994:

" Table 16 - Metafile descriptor elements

Element	Specifications - PPF	Specifications - Model Profile
T.16.24 PICTURE DIRECTORY [v4] References: 5.3.24	Same as Model Profile ☐ Element is: Required ☐ Permitted ☐ Prohibited ☐ Follows rules for non-graphical text strings for *picture identifier* parameter, clause 7.5.4.6. Other:	[redacted] Element is: Required ☐ Permitted ☑ Prohibited ☐ Follow rules for non-graphical text strings for *picture identifier* parameter, clause 7.5.4.6. Other: ***None.***

"

" Table 16 - Metafile descriptor elements

Element	Specifications - PPF	Specifications - Model Profile
T.16.24 PICTURE DIRECTORY [v4] References: 5.3.24	Same as Model Profile ☐	
	Element is: Required ☐ Permitted ☐ Prohibited ☐ Follows rules for non-graphical text strings for *picture identifier* parameter, clause 7.5.4.6. Other:	Element is: Required ☐ Permitted ☑ Prohibited ☐ Follow rules for non-graphical text strings for *picture identifier* parameter, clause 7.5.4.6. Other: ***None.***

"

Add the following to Table 17 - Picture descriptor elements, page 51, ISO/IEC 8632-1:1992/Amd.1:1994:

" Table 17 - Picture descriptor elements

Element	Specifications - PPF	Specifications - Model Profile
T.17.20 APPLICATION STRUCTURE DIRECTORY [v4] References: 5.3.20	Same as Model Profile ☐	
	Element: Required ☐ Permitted ☐ Prohibited ☐ Follow rules for non-graphical text strings for *application structure identifier* parameter, clause 7.5.4.6. Other:	Element: Required ☐ Permitted ☑ Prohibited ☐ Follow rules for non-graphical text strings for *application structure identifier* parameter, clause 7.5.4.6. Other: ***None.***

"

" Table 17 - Picture descriptor elements

Element	Specifications - PPF	Specifications - Model Profile
T.17.20 APPLICATION STRUCTURE DIRECTORY [v4] References: 5.3.20	Same as Model Profile ☐ Element: Required ☐ Permitted ☐ Prohibited ☐ Follow rules for non-graphical text strings for *application structure identifier* parameter, clause 7.5.4.6. Other:	Element: Required ☐ Permitted ☑ Prohibited ☐ Follow rules for non-graphical text strings for *application structure identifier* parameter, clause 7.5.4.6. Other: ***None.***

"

Add a new Table 24 - Application structure descriptor elements, page 96, ISO/IEC 8632-1:1992/Amd.1:1994: