

Implementation of  
ISO/IEC 8613-8:1994

**Information  
technology —  
Open Document  
Architecture (ODA) and  
Interchange Format:  
Geometric graphics  
content architectures**

# Committees responsible for this British Standard

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- British Computer Society
- British Telecommunications plc
- Digital Equipment Co. Ltd.
- HM Treasury (Central Computer and Telecommunications Agency)
- IBM United Kingdom Ltd.
- International Computers Limited
- Joint Information Systems Committee of the Higher Education Funding Council
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## National foreword

This British Standard reproduces verbatim ISO/IEC 8613-8:1994 and implements it as the UK national standard. It supersedes BS 7299-8:1990 which is obsolescent. ISO 8613-8:1989, with which BS 7299-8:1990 is identical, is referenced in a number of International Standardized Profiles (ISPs), BSI has therefore decided to retain BS 7299-8:1990 as available for purchase.

This British Standard is published under the direction of the Information Systems Technology Assembly whose Technical Committee IST/18 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO/IEC title page, pages ii to vi, pages 1 to 41 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

INTERNATIONAL  
STANDARD

**ISO/IEC**  
**8613-8**

Second edition  
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## **Information technology — Open Document Architecture (ODA) and Interchange Format: Geometric graphics content architectures**

*Technologies de l'information — Architecture des documents ouverts  
(ODA) et format d'échange: Architecture des contenus des caractères  
graphiques géométriques*



Reference number  
ISO/IEC 8613-8:1994(E)

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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.

International Standard ISO/IEC 8613-8 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 18, *Document processing and related communication*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation T 418.

This second edition cancels and replaces the first edition (ISO 8613-8:1989), which has been technically revised.

ISO/IEC 8613 consists of the following parts, under the general title *Information technology — Open Document Architecture (ODA) and interchange format*:

- *Part 1: Introduction and general principles;*
- *Part 2: Document structures;*
- *Part 3: Abstract interface for the manipulation of ODA documents;*
- *Part 4: Document profile;*
- *Part 5: Open document interchange format;*
- *Part 6: Character content architectures;*
- *Part 7: Raster graphics content architectures;*
- *Part 8: Geometric graphics content architectures;*
- *Part 9: Audio content architectures;*
- *Part 10: Formal specifications;*
- *Part 11: Tabular structures and tabular layout;*
- *Part 12: Identification of document fragments;*
- *Part 13: Spreadsheet;*
- *Part 14: Temporal relationships and non-linear structures.*



## Introduction

This ITU-T Recommendation | International Standard was prepared as a joint publication by ITU-T Study Group 8 and ISO/IEC Joint Technical Committee 1.

At present, the ITU-T Recommendation T.410-Series | ISO/IEC 8613 consists of:

- Introduction and general principles;
- Document structures;
- Document profile;
- Open document interchange formats;
- Character content architectures;
- Raster graphics content architectures;
- Geometric graphics content architectures;
- Formal Specification of the Open Document Architecture (FODA).

(The formal specification is applicable to ISO/IEC 8613 only).

Further Recommendations | International Standards may be added to this series of ITU-T Recommendations | International Standards.

Development of this series of ITU-T Recommendations | International Standards was originally in parallel with the ECMA-101 standard: Open Document Architecture.

This series of ITU-T Recommendations | International Standards is a new edition of the CCITT T.410-Series of Recommendations (1988) and ISO 8613 (1989).

Significant technical changes are the inclusion of the following amendments as agreed by ITU-T and ISO/IEC:

- Alternative representation;
- Annex on use of MHS/MOTIS;
- Colour;
- Conformance Testing Annex;
- Document Application Profile, Proforma and Notation;
- Security;
- Streams;
- Styles;
- Tiled raster graphics.

In addition, a number of technical corrigenda have been applied to this ITU-T Recommendation | International Standard.

This ITU-T Recommendation | International Standard contains three annexes:

- Annex A summarises the ASN.1 object identifiers (non-integral);
- Annex B describes the differences between character primitives in the geometric graphics and the content structured according to the character content architectures defined in ITU-T Rec. T.416 | ISO/IEC 8613-6 (non-integral);
- Annex C describes the SGML representation of geometric graphics content-specific attributes for ODL (integral).

(The use of Annex C is applicable to ISO/IEC 8613 only.)

## 1 Scope

The purpose of the ITU-T Rec. T.410-Series | ISO/IEC 8613 is to facilitate the interchange of documents.

In the context of these Recommendations | International Standards, documents are to be items such as memoranda, letters, invoices, forms and reports, which may include pictures and tabular material. The content elements used within the documents may include graphic characters, raster graphics elements and geometric graphics elements, all potentially within one document.

NOTE These Recommendations | International Standards are designed to allow for extensions, including hypermedia features, spreadsheets and additional types of content such as audio and video.

In addition to the content types defined in these Recommendations | International Standards, ODA also provides for arbitrary content types to be included in documents.

These Recommendations | International Standards apply to the interchange of documents by means of data communication or the exchange of storage media.

These Recommendations | International Standards provide for the interchange of documents for either or both of the following purposes:

- to allow presentation as intended by the originator;
- to allow processing such as editing and reformatting.

The composition of a document in interchange can take several forms:

- formatted form, allowing presentation of the document;
- processable form, allowing processing of the document;
- formatted processable form, allowing both presentation and processing.

These Recommendations | International Standards also provide for the interchange of ODA information structures used for the processing of interchanged documents.

This ITU-T Recommendation | International Standard:

- defines a geometric graphics content architecture that can be used in conjunction with the document architecture defined in ITU-T Rec. T.412 | ISO/IEC 8613-2;
- defines an interface which allows the use of content structured according to ISO/IEC 8632 within documents structured according to ITU-T Rec. T.412 | ISO/IEC 8613-2;
- defines those aspects of positioning and imaging applicable to the presentation of this geometric graphics content architecture in a basic layout object;
- defines the presentation attributes applicable to this geometric graphics content architecture;
- describes a content layout process, which together with the document layout process described in ITU-T Rec. T.412 | ISO/IEC 8613-2, describes the layout of geometric graphics content in basic layout objects and determines the dimensions of these basic layout objects.

## 2 Normative references

The following ITU-T/CCITT Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations | International Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and International Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The ITU-T Secretariat maintains a list of currently valid ITU-T/CCITT Recommendations.

### 2.1 Identical Recommendations | International Standards

- ITU-T Recommendation T.411 (1993) | ISO/IEC 8613-1:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Introduction and general principles*.
- ITU-T Recommendation T.412 (1993) | ISO/IEC 8613-2:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Document structures*.
- ITU-T Recommendation T.414 (1993) | ISO/IEC 8613-4:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Document profile*.
- ITU-T Recommendation T.415 (1993) | ISO/IEC 8613-5:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Open Document Interchange Format*.
- ITU-T Recommendation T.416 (1993) | ISO/IEC 8613-6:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Character content architectures*.
- ITU-T Recommendation T.417 (1993) | ISO/IEC 8613-7:1994, *Information technology — Open Document Architecture (ODA) and Interchange Format: Raster graphics content architectures*.

## 2.2 Paired Recommendations | International Standards equivalent in technical content

— CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1)*.  
 ISO/IEC 8824:1990, *Information technology — Open Systems Interconnection — Specification of Abstract Syntax Notation One (ASN.1)*.

## 2.3 Additional references

— ISO/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange*.  
 — ISO/IEC 8632-1:1992, *Information technology — Computer graphics — Metafile for the storage and transfer of picture description information — Part 1: Functional specification*.  
 — ISO/IEC 8632-3:1992, *Information technology — Computer graphics — Metafile for the storage and transfer of picture description information — Part 3: Binary encoding*.  
 — ISO 8879:1986, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML)*.

## 3 Definitions

For the purposes of this Recommendation | International Standard, the definitions given in ITU-T Rec. T.411 | ISO/IEC 8613-1, ISO/IEC 8632-1 and ISO 8879 apply.

## 4 Abbreviations

For the purposes of this Recommendation | International Standard the abbreviations given in ITU-T Rec. T.411 | ISO/IEC 8613-1 apply.

For the purposes of this Recommendation | International Standard the following additional abbreviations apply.

|      |                                         |
|------|-----------------------------------------|
| ASF  | Aspect source flag                      |
| CCA  | Character content architecture          |
| GGCA | Geometric graphics content architecture |
| NX   | Number of columns in pattern array      |
| NY   | Number of rows in pattern array         |
| VDC  | Virtual Device Coordinate(s)            |

## 5 Conventions

For the purposes of this Recommendation | International Standard the conventions given in ITU-T Rec. T.411 | ISO/IEC 8613-1 apply.

The following additional conventions are used within this Recommendation | International Standard.

### 5.1 CGM

The term CGM is used to reference the Computer Graphics Metafile defined in ISO/IEC 8632. It is used as a qualifier for terms defined in ISO/IEC 8632 (for example, CGM elements).

### 5.2 Individual CGM elements

Throughout this Specification whenever individual CGM elements are referred to they are written in uppercase; for example, SCALING MODE.

### 5.3 CGM concepts

Whenever the concepts defined in CGM are referred to they are written in mixed upper and lower case as appropriate; for example, Direct Colour or Virtual Device Coordinates.

### 5.4 CGM defaults

This Specification uses the term *CGM defaults* whenever ISO/IEC 8632 uses the term *metafile defaults*. This is intended to indicate the different semantics, in conformance with 5.1, of the term *defaults* when used in the context of the ITU-T Rec. T.410-Series | ISO/IEC 8613 (ODA) or of ISO/IEC 8632 (CGM).

## 5.5 Parameter names

Whenever parameters or sub-parameters of presentation attributes defined in this Specification refer to elements or parameters defined in ISO/IEC 8632 the parameter names and sub-parameter names respectively, are written in mixed upper and lower case as appropriate; for example, Scaling Mode or Line Type.

## 5.6 Width and height

*Width* is used throughout this Specification to express the extent of a two-dimensional area in the direction given by the counter-clockwise rotation from the horizontal direction as specified by the geometric graphics presentation attribute “picture orientation”.

*Height* is used throughout this Specification to express the extent of a two-dimensional area orthogonal to its width.

NOTE Width and height are mostly used in combination with a reference to an area; for example, width of the available area.

## 6 General principles

### 6.1 Content architecture classes

This Specification defines one class of geometric graphics content architectures:

- a formatted processable form, which allows for document content to be processed and also to be presented as intended by the originator. Formatted processable form content may be associated with any basic component.

### 6.2 Content

A content portion that is structured according to a geometric graphics content architecture represents a single pictorial image. The representation is based on the Computer Graphics Metafile (CGM) defined in ISO/IEC 8632 (see 9.2). The functionality used in this Specification is limited to Version 1 metafiles.

The CGM provides a format suitable for the storage, retrieval and interchange of picture description information. The format consists of an ordered set of elements. These elements are split into groups that

- structure the information in the metafile;
- specify the precision of the values used within the metafile;
- control the display of the picture;
- perform basic drawing actions;
- control the attributes of the basic drawing actions;
- provide access to non-standard device capabilities.

ISO/IEC 8632 defines the form (syntax) and the functional behaviour (semantics) of these elements.

### 6.3 Presentation attributes

The geometric graphics content architecture defines geometric graphics presentation attributes applicable to basic layout and basic logical components. The geometric graphics presentation attributes direct the content layout process and specify the initial conditions at the start of the presentation of the content associated with a basic object.

Only the geometric graphics presentation attributes specifying CGM defaults (see 8.1.1) may be overwritten by CGM elements in the content of the basic component to which they apply.

The functionality represented by the geometric graphics presentation attributes specifying CGM defaults (see 8.1.1) and CGM element groups is that defined by ISO/IEC 8632-1 and ISO/IEC 8632-3, except that the defaulting rules are modified (see 12.2.1).

All geometric graphics presentation attributes are:

- non-mandatory for presentation styles;
- non-mandatory for object class descriptions;
- defaultable when applied to object descriptions.

Presentation attributes are classified as shared attributes, layout attributes or logical attributes:

- shared attributes are applicable to logical and layout components;
- layout attributes are applicable only to layout components;

— logical attributes are applicable only to logical components.

#### 6.4 Coding of content information

The ordered set of elements of the content portion is encoded according to the binary encoding defined in ISO/IEC 8632-3 and constitutes a complete CGM, which is limited to contain only one picture.

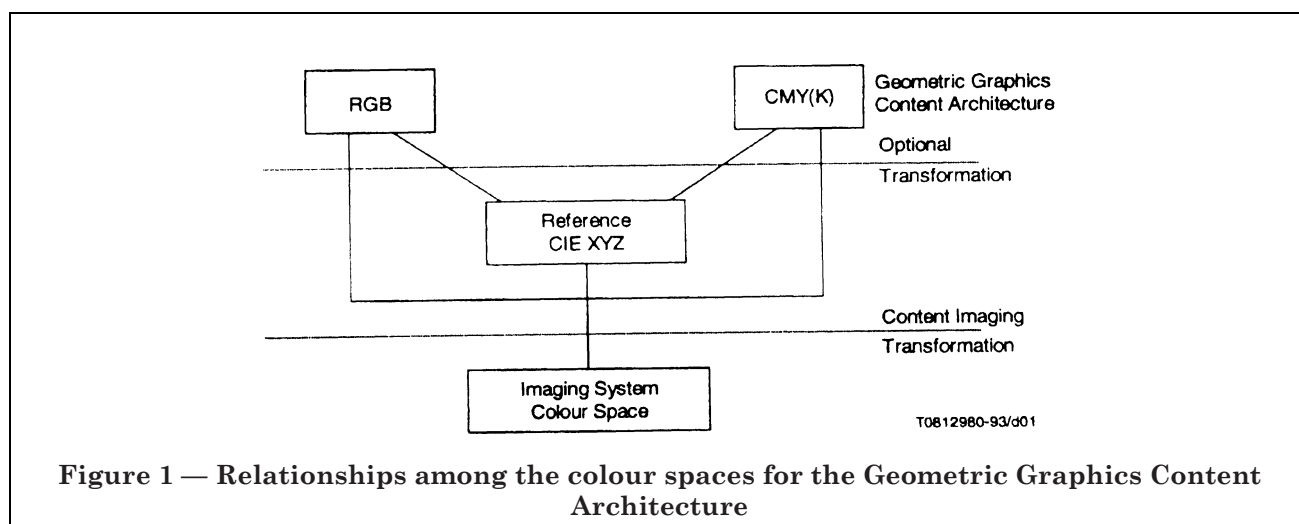
#### 6.5 Layout and imaging of the content

The geometric graphics content architecture describes a content layout process which creates a basic layout object and determines the dimensions of this object into which the content associated with a basic logical object is to be laid out.

It also describes a content imaging process which determines the image of the content.

#### 6.6 Colour spaces applicable to geometric graphics content architecture

The geometric graphics content architecture may employ colour specification in RGB or CMY(K) when there is no internal CGM colour table (see Figure 1). The indexed colour expression is used when geometric graphics content employs indexed mode and does not contain a colour look-up table (LUT). The CMY(K) colour space is employed only in an indexed colour expression.



## 7 Positioning

### 7.1 Introduction

This clause describes the general principles concerning the positioning of a part of the VDC Space within basic layout objects.

This part is known as the *region of interest*. It is a rectangular region within the VDC Space, and is defined by two VDC pairs termed *First Corner* and *Second Corner*.

NOTE The VDC Space is used within ISO/IEC 8632 for positioning geometric graphics elements, specifying directions, dimensions, etc.

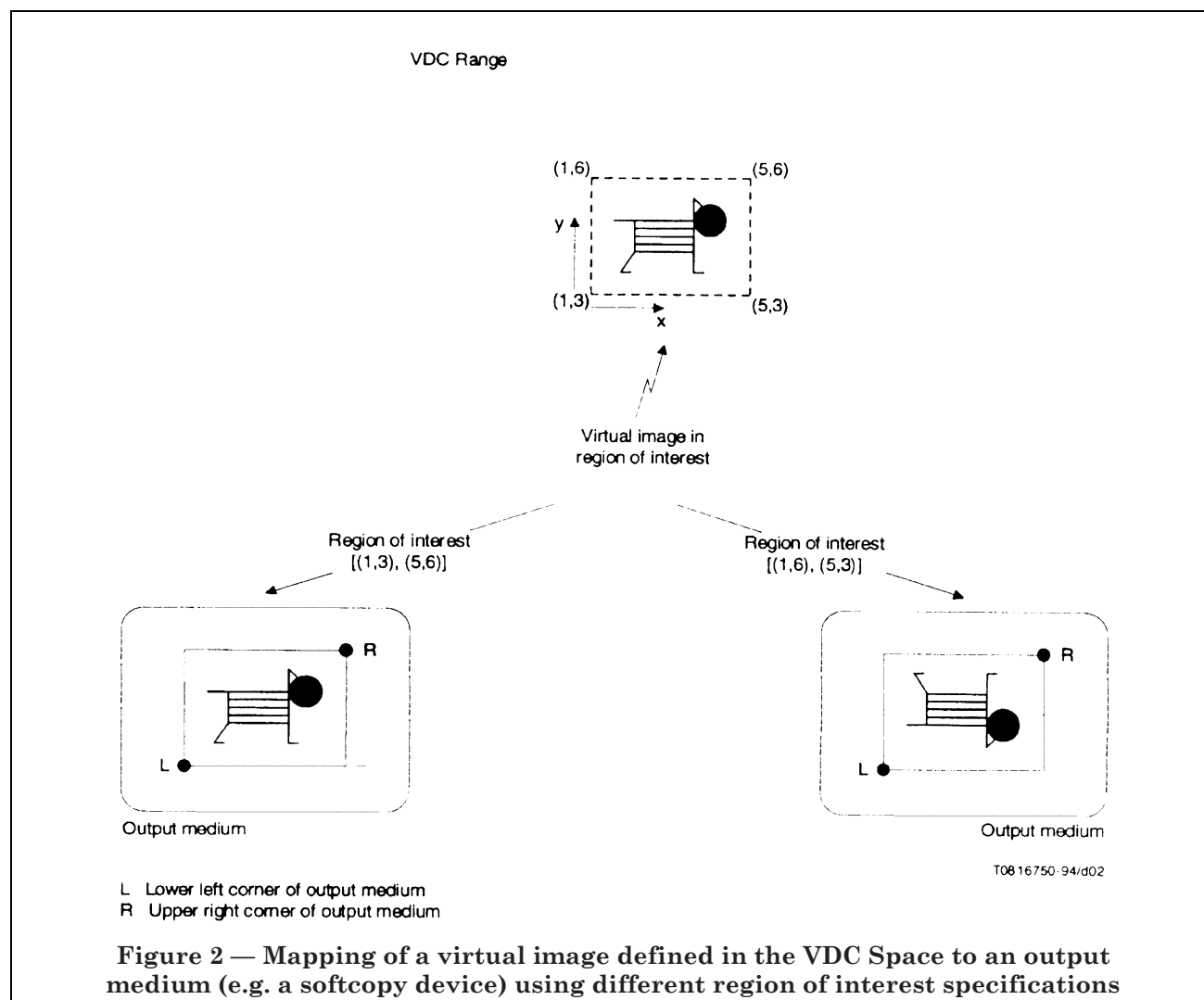
### 7.2 Measurement units and directions

The positioning of geometric graphics content within a basic layout object is specified with relation to an orthogonal coordinate system.

The definition of the region of interest specifies the origin and directions of the axes of the coordinate system, with respect to the basic layout object.

Figure 2 illustrates that depending on which coordinates of the VDC Space are referenced by First Corner and Second Corner the region of interest can affect the orientation of the axes used when imaging the geometric graphics content.

The measurement units of the x- and y-axis of the coordinate system are determined by the relationship of the dimensions of the region of interest to the dimensions of the basic layout object.



### 7.3 The relationship between the region of interest and the basic layout object

When imaging geometric graphics content, the geometric graphics presentation attribute “picture orientation” determines the relationship of the First Corner of the region of interest to the corners of the basic layout object.

The First Corner of the region of interest is coincident with the corner of the basic layout object defined by the geometric graphics presentation attribute “picture orientation” (for example, the bottom left corner if the presentation attribute “picture orientation” has the value “d0”, see 8.1.3). The Second Corner of the region of interest is coincident with the diagonally opposite corner of the basic layout object. It is implied that the x-axis of the VDC Space always maps to the direction parallel to the width of the basic layout object. Figure 3 and Figure 4 illustrate this mapping.