Working Implementation Agreements for Open Systems Interconnection Protocols: Part 23 - ODA RASTER DAP (BASIC)

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Foreword

This part of the Working Implementation Agreements was prepared by the Office Document Architecture (ODA) Special Interest Group (SIG) of the National Institute of Standards and Technology (NIST) Workshop for Implementors of Open Systems Interconnection (OSI). Development of this document application profile has been done in liaison with several organizations. These include the DoD Computer-aided Acquisition and Logistic Support (CALS) Office, Navy's David Taylor Research Center, and the ad-hoc Tiling Task Group.

This document application profile is intended to be suitable for the interchange of large format raster images.

This part contains four annexes:

a) annex A (normative): Addenda and errata;

b) annex B (informative): Recommended practices;

c) annex C (informative): References to other standards and registers;

d) annex D (informative): Supplementary information on attributes.

Future changes and additions to this version of these Implementor Agreements will be published as a new part. Deleted and replaced text will be shown as ~~strickout~~. New and replacement text will be shown as shaded.

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Part 23 - ODA RASTER DAP (BASIC)

0 Introduction

This is the definition of a single specification for two Open Document Architecture (ODA) Document Application Profiles (DAPs) named ODA Raster DAP. The two DAPs differ only in the encoding of the data stream. One uses the ASN.1 based ODIF encoding. The other uses the SGML/SDIF based ODL encoding. When this document refers to *this profile*, it is referring to either of the DAPs defined by this specification.

This DAP is suitable for interchanging documents in formatted form. The documents contain only raster graphics images. This DAP has been prepared by the ODA Special Interest Group of the National Institute of Standards and Technology (NIST) Open Systems Interconnection (OSI) Implementors Workshop. The DAP is defined in accordance with ISO 8613-1 and CCITT T.411 and follows the standardized proforma and notation defined in ISO 8613-1 Annex F. The DAP is based on ODA as defined in ISO 8613 and the Tiling Addendum to ISO 8613, Part 7.

1 Scope

This DAP specifies an interchange format suitable for transfer of structured documents between equipment designed for raster processing. The documents supported by this DAP are based on a paradigm of an electronic engineering drawing or illustration. Such documents contain one or more pages. Each page consists of an image in the form of a bi-tonal raster graphics content. There is no restriction on the minimum size of the image.

This document defines a DAP that allows large format raster documents to be interchanged in a formatted form in accordance with ISO 8613.

It is assumed that, when negotiation is performed by the service using this DAP, all non-basic features are subject to negotiation.

This DAP is independent of the processes carried out in an end system to create, edit, or reproduce raster documents. It is also independent of the means to transfer the document which, for example, may be by means of communication links or exchanged storage media.

The features of a document that can be interchanged using this DAP fall into the following categories:

a) Page format features - these concern how the layout of each page of a document will appear when reproduced;

b) Raster graphics layout and imaging features - these concern how the document content will appear within pages of the reproduced document; and

c) Raster graphics coding - these concern the raster graphics representations and control functions that make up the document raster graphics content.

2 Normative References

The following references are required in order to implement this DAP:

ISO 8613-1 : 1989, Information processing - Text and Office Systems; Open Document Architecture (ODA) and Interchange Format - Part 1: Introduction and General Principles;

ISO 8613-2 : 1989, Information processing - Text and Office Systems; Open Document Architecture (ODA) and Interchange Format - Part 2: Document Structures;

ISO 8613-4 : 1989, Information processing - Text and Office Systems; Open Document Architecture (ODA) and Interchange Format - Part 4: Document Profile;

ISO 8613-5 : 1989, Information processing - Text and Office Systems; Open Document Architecture (ODA) and Interchange Format - Part 5: Open Document Interchange Format;

ISO 8613-7 : 1989, Information processing - Text and Office Systems; Open Document Architecture (ODA) and Interchange Format - Part 7: Raster Graphics Content Architectures;

ISO 8613-1 : 1991, Information processing - Text and Office Systems; Office Document Architecture (ODA) and Interchange Format - Part 1: Annex F - A Document Application Profile Proforma and Notation;

ISO 8613-7 : (to be published), Information processing - Text and Office Systems; Office Document Architecture (ODA) and Interchange Format - Part 7: DAD - Tiled Raster Graphics Addendum to ISO 8613, Part 7;

ISO 8824 : 1987,Information Processing Systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1);

ISO 8825 : 1987,Information Processing Systems - Open Systems Interconnection - Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1);

ISO 8879 : 1986,Information processing - Text and office systems - Standard Generalized Markup Language (SGML);

ISO 9069 : 1988, Information processing - SGML support facilities - SGML Document Interchange Format (SDIF);

CCITT Recommendation T.6 : 1988, Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus.

3 Definitions and Terminology

3.1 Definitions

The definitions given in ISO 8613-1 are applicable to this document.

3.2 Constituent Names

Each constituent that may be included in a document that conforms to this profile has been given a unique name which serves to identify that constituent throughout this profile.

The convention is that full names are used (i.e., no abbreviations are used), two or more words in a name are concatenated and each word begins with a capital. Examples of constituent names used in this profile are CompositePage, DocumentLayoutRoot, and SpecificBlock.

In clause 6 of this profile, each constituent provided by this profile is underlined once at the point in the text at which the purpose of that constituent is defined. This also serves to identify all the constituents provided by this profile.

The same constituent names are also used in the technical specification in clause 7 of this profile so that there is a one-to-one correspondence between the use of these names in clauses 6 and 7.

Although the constituent names relate to the purpose of the constituents, the semantics of constituents must not be implied from the actual names that are used. Also, these names do not appear in an interchanged document but a mechanism for identifying constituents in an interchange document is provided. Thus in an application using this profile, the constituents may be known to the user by different names.

4 Relationship to other DAPs

Functionally, this DAP is a functional superset of the CCITT Recommendation T.503, A Document Application Profile for the Interchange of Group 4 Facsimile Documents.

5 Conformance

In order to conform to this DAP, a data stream representing a document must meet the requirements specified in 5.1.

The requirements for implementations that originate and/or receive data streams conforming to this DAP are specified in 5.2.

5.1 Data Stream Conformance

The following requirements apply to the encoding of data streams that conform to these agreements.

a) The data stream shall be encoded in accordance with the ASN.1 encoding rules defined in ISO 8825 or the SGML encoding rules defined in ISO 8879;

b) The data stream shall be structured in accordance with the interchange format defined in clause 8 of this DAP;

c) The document shall be structured in accordance with only the formatted document architecture class specified in clause 7 of this DAP. In addition, the document shall contain all mandatory constituents specified for that class and may optionally contain constituents permitted for that class as specified in clause 7;

d) Each constituent shall contain all those attributes specified as required for that constituent in this profile. Other attributes may be specified provided they are permitted for that constituent;

e) The attributes shall have values within the range of permissible values specified in this profile;

f) The encoded document shall be structured in accordance with the abstract document architecture defined in ISO 8613-2;

g) The encoded document shall be structured in accordance with the characteristics defined in clause 6 of this DAP and shall contain only those features defined in clause 6.

5.2 Implementation Conformance

This clause states the requirements for implementations claiming conformance to this DAP.

A conforming receiving implementation must be capable of receiving *either* any data streams conforming to this profile structured in accordance with ODIF *or* any data streams conforming to this profile structured in accordance with ODL *or* both of these. Receiving usually, but not always, involves recognizing and further processing the data stream elements.

6 Characteristics Supported by this DAP

This clause describes the characteristics of documents that can be represented by data streams conforming to this profile. This clause also describes how these characteristics are represented in terms of divisional components of the data streams.

6.1 Overview

This DAP describes the features of ISO 8613 that are needed to support the interchange of documents containing only raster graphics content. It specifies interchange formats for the transfer of structured documents with simple layout structures.

This DAP describes documents that can be interchanged in the formatted form, which facilitates the reproduction of a document as intended by the originator.

Only one category of content is allowed within the document, that is, a raster graphics content in the formatted processable form. This is intended to facilitate the reproduction of the document content as intended by the originator or facilitates the revision of the document content.

This clause describes the layout features that can be represented in documents conforming to this DAP. The features are described in terms that are typical of the user-perceived capabilities and semantics found in a raster document interchange environment.

For the purpose of interchange, a document is represented as a collection of **constituents**, each of which is represented by a set of attributes. The constituents that make up a formatted document are defined below in this clause and are illustrated in figure 1.

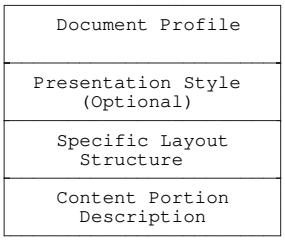

Figure 1 - Constituents

Constituents defined as **required** must occur in any document that conforms to this profile. Constituents listed as **optional** may or may not be present in the document, depending on the requirements of the particular document.

The required constituents include:

- a document profile,
- layout object descriptions representing a specific layout structure, and
- content portion description.

The only optional constituent is the presentation style.

6.2 Logical Constituents

Not applicable.

6.3 Layout Constituents

This clause describes the features of the layout objects that can be represented in documents conforming to this DAP.

6.3.1 Overview of the Layout Characteristics

The document structure allows the document content to be laid out and presented in one or more pages. Each page in a document consists of only a single raster graphics content representing an engineering drawing, illustration, or other raster scanned image.

A specific layout structure of the document conforming to this application profile consists of a four-level hierarchy consisting of a document layout root, composite pages, frames, and blocks. The document can consist of multiple composite pages where each page represents a single image. Each composite page consists of a frame which in turn contains a block containing the content associated with the image.

Figure 2 is an illustration of the features of the document layout structure supported by this DAP:

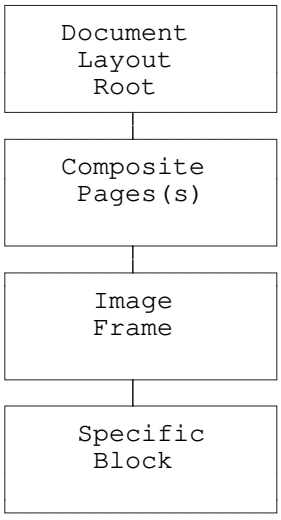

Figure 2 - Document Layout Structure

6.3.2 DocumentLayoutRoot

A DocumentLayoutRoot is the top level in a document layout structure. A DocumentLayoutRoot consists of a sequence of one or more CompositePage constituent constraints.

6.3.3 Page Characteristics

Only one constituent constraint is provided to present pages within a document.

A document consists of a sequence of one or more composite pages. In a document's composite page, a frame is used to position a single raster graphics content representing the image on the page.

A document may consist of multiple pages of different sizes. Each page may be either landscape or portrait orientation. Both orientations are permitted in the document.

6.3.3.1 CompositePage

A CompositePage is a constituent constraint which defines a composite-page that corresponds to the page area used for presenting the sequence of an ImageFrame frame.

6.3.3.2 Page Dimensions

A wide variety of page dimensions are supported including large format raster documents. The dimensions of the pages may be specified as any value, in BMU measurement units, including the larger sizes produced from foldout-size images and roll paper. These sizes apply to both portrait and landscape orientations.

Dimensions equivalent to or less than the actual (nominal) page sizes of ANSI E in both portrait and landscape orientations are basic values. Larger dimensions (F-K) including those produced from roll paper are non-basic and their use must be indicated in the document profile. Although ISO A0-A4 sizes are not generally used, the A1-A4 sizes do fall within the range of the ANSI E sizes and therefore could be considered basic values (See table 2). A0 size is a non-basic value.

The default dimensions are the Common Assured Reproduction Area (CARA) of North American Letter (A). Any default page dimensions may be specified in the document profile subject to the maximum dimensions defined above by using the Page-dimensions attribute. The Page-position attribute may be used to specify the position of the pel array image on the page. Although actual page dimensions may be used allowing for the raster content to completely fill a page leaving no borders, it is advised that the assured reproduction area (ARA) listed in table 1 be used wherever feasible. See ISO 8613-2, clause 7.3, General rules for positioning pages on presentation surfaces.

6.3.3.3 Nominal Page Sizes

The nominal page sizes that may be specified are listed in Table 1. These may be specified in portrait or landscape orientations. All values of nominal page size up to ANSI E size are basic. All sizes larger than

ANSI E size and roll paper are non-basic and their use in a document must be indicated in the document profile using the Medium-type attribute (See table 2).

Any of the nominal page sizes defined in Table 1, subject to the restriction specified above, may be specified as the default value in the document profile.

Table 1 also includes the recommended assured reproduction area (ARA). Information loss may occur when a document is reproduced if the dimensions of the CompositePage exceed the ARA for the specified nominal page size.

Table 1 Dimensions for Various Page Sizes

Page Type	Size	Size (BMU)	ARA (BMU)
- Metric			
ISO-A5	148mm x 210mm	7015 x 9920	not defined
ISO-A4	210mm x 297mm	9920 x 14030	9240 x 13200
ISO-A3	297mm x 420mm	14030 x 19840	13200 x 18480
ISO-A2	420mm x 594mm	19840 x 28060	18898 x 27118
ISO-A1	594mm x 841mm	28060 x 39680	26173 x 37843
ISO-A0	841mm x 1189mm	39680 x 56120	37843 x 54283
- ANSI, North American (NA)			
NA-A	8.5in x 11in	10200 x 13200	9240 x 12400
NA-B	11in x 17in	13200 x 20400	12744 x 19656
NA-C	17in x 22in	20400 x 26400	19500 x 25800
NA-D	22in x 34in	26400 x 40800	25800 x 39600
NA-E	34in x 44in	40800 x 52800	39600 x 52200
NA-F	28in x 40in	33600 x 48000	32400 x 47400
NA-G	11in x 90in	13200 x 108000	12400 x 106800
NA-H	28in x 143in	33600 x 171600	31400 x 170400
NA-J	34in x 176in	40800 x 211200	39600 x 210000
NA-K	40in x 143in	48000 x 171600	47400 x 170400
NA-Legal	8.5in x 14in	10200 x 16800	9240 x 15480
- Foldouts			
Small	11in x 14in	13200 x 16800	12744 x 15480
NA-B	11in x 17in	13200 x 20400	12744 x 19656

Tutorial Note - These page sizes are for the portrait orientation.

Table 2 Layout Attributes

Attributes	Basic Values	Default Values	Non-Basic Values
Page Dimensions **	CARA NA A-F, CARA NA-Legal, ISO A4-A1, Small Foldout	CARA NA-A	ARA NA G-K, ISO A0, 11" Roll
Medium-type ** (Nominal page size)	NA A-F, NA-Legal, ISO A4-A1, Small Foldout	NA-A	NA G-K, ISO A0, 11" roll

Tutorial Note - See Table 1 **

6.3.4ImageFrame

An ImageFrame is a constituent constraint which defines a lowest level frame used for laying out the image of an engineering drawing, illustration or other raster scanned image. This frame contains a single SpecificBlock containing a raster graphics content portion. Note that there must be exactly one ImageFrame on each page and one block in the frame.

The frame has a fixed position that is equal to the origin of the page. The vertical and horizontal dimensions of this frame are fixed and equal to the maximum size that can be achieved for the position within the area of the page.

6.3.5SpecificBlock

A SpecificBlock is a constituent constraint which defines a basic layout object used to position and image the content portions associated with an ImageFrame.

The position of the block is fixed and defaults to the origin of the superior frame. The dimensions default to the maximum size that can be achieved for the position within the area of the superior frame.

6.4Document Layout Characteristics

This DAP provides for only formatted documents. Hence, no provision is made for constraining the document layout process other than as implied in the formatted documents supported by this DAP. In particular, these formatted documents are characterized by the following:

a) Documents containing only composite pages;

b) Documents may contain one or more pages;

c) Pages may vary by orientation within a document;

d) Each page contains a single raster graphics content portion representing the image;

e) Content is positioned within fixed position and dimension frames.

6.5Content Layout and Imaging Control

A document is modelled as an image represented by a raster graphics content portion, as specified in ISO 8613-7.

The only content architecture that may be specified using the attribute *Content architecture class* is formatted processable raster graphics. The formatted processable raster graphics content must be specified as the default in the document profile.

6.5.1Raster Graphics Content

6.5.1.1Introduction

This clause defines the features that are applicable to the raster graphics content.

The default values for the following features may be specified in the document profile:

- type of coding (required);

- compression;

- pel path;

- line progression;

- pel spacing;

- spacing ratio;

- clipping.

The specification in a document of a non-basic feature by a presentation or coding attribute must be indicated in the document profile.

6.5.1.2Raster Graphics Content Architecture

The formatted processable raster graphics content is the only content architecture class supported by this DAP and is the only default content architecture class that can be specified in the document profile.

In a composite page, only one content portion can be associated with the image.

6.5.1.3Raster Graphics Encoding Methods

Three encoding methods, CCITT T.6 (untiled), Tiled, and Bitmap are supported by this profile as basic values. Neither the CCITT T.4 one dimensional method nor the CCITT T.4 two dimensional method is supported.

The CCITT Recommendation T.6 Group 4 compression algorithm shall be used in all cases, tiled and untiled, except where it is more efficient to retain an image or tile image in bitmap format or to specify a tile as being either all background or all foreground.

'Uncompressed' mode of encoding may also be used but only as a non-basic feature.

In a content portion, it is required that the Number-of-pels-per-line and Number-of-lines parameters of the Coding-attributes attributes be specified. The value of these parameters shall be a positive number. Otherwise, no constraints are placed on these parameters by this profile. This profile places no constraints on the size of the pel arrays that may be used as long as the size does not exceed the page dimension size.

The type of coding method used is specified by the attribute Type-of-coding. The use of this attribute is mandatory in the Document-architecture-defaults of the document profile to define the default value of either T.6 encoding (untiled) or Tiled encoding. The use of this attribute in the description of the content portions is non-mandatory. If this attribute is not specified for a particular content portion, then the default value specified in the Document-architecture-defaults of the document profile is used.

If the Tiled encoding method is used, the default value of 512 for the Number-of-pels-per-tile-line and Number-of-lines-per-tile must be used. No other values are supported, therefore these two attributes do not need to be specified. If the Tile-types attribute is not present, then all tiles will be T.6 encoded. If it is present, then there must be a value specified for each tile in which case only null background, null foreground, T.6 encoded, or bitmap encoded values are supported. T.4 one dimensional and T.4 two dimensional encodings are not supported. There are no restrictions on the use of the Tiling-offset other than that specified in ISO 8613-7 Addendum.

See table D.1, Annex D, for a tabulated list of the attributes and their basic, default, and non-basic values.

6.5.1.4Raster Presentation

Raster presentation is controlled by the presentation attributes specified in ISO 8613-7. This DAP provides for additional constraints on these presentation attributes as specified below.

The basic Pel-path values supported by this profile are 0 and 90 degrees. The Pel-path values of 180 and 270 degrees are non-basic.

The basic Line-progression value supported by this profile is 270 degrees. The Line-progression value of 90 degrees is non-basic.

The basic Pel-spacing values supported by this profile are the ratios equal to 6 and 4 BMUs between adjacent pels. This corresponds to equivalent resolutions of 200 and 300 pels per 25.4mm (1 in.), respectively when the BMU is interpreted as 1/1200 inch. Values for Pel-spacing other than these ratios are non-basic, i.e., 5, 3, 2, and 1 BMU. These correspond to equivalent resolutions of 240, 400, 600, and 1200 pels per 25.4mm (1 in.).

There are no restrictions on the use of the Clipping attribute. The Image-dimensions attribute is not supported.

There are no restrictions placed on the value of the Spacing-ratio providing that the resultant line spacing is not less than 1 BMU. Also, the line spacing need not be an integral number of BMUs. All values are basic.

See table D.2, Annex D, for a tabulated list of the attributes and their basic, default, and non-basic values.

6.6Miscellaneous Features

Specification of the attribute Application-comments is optional. When used in conjunction with the Type-of-coding of 'Tiled', it contains a sequence of positive integers, one for each tile in the content portion. The sequence of integers is a set of indices representing the octet offsets to the beginning of the respective tiles, starting from the beginning of the "content-information". A tile index of zero(0) indicates that the respective tile is null. The integers will be sequenced in the same order as the tiles. The tiles will be sequenced primarily in the Pel-path and secondarily in the Line-progression direction as defined by the presentation attributes.

6.7Document Management Features

Every document interchanged in accordance with this DAP must include a document profile containing information which relates to the document as a whole.

The features specified by the document profile are listed below. A definition of the information contained in these features is given in the corresponding attribute definitions in ISO 8613-4.

Document constituent information:

a) specific layout structure;

b) presentation styles (optional);

Document characteristics:

a) document application profile;

b) document application profile defaults;

c) document architecture class;

d) content architecture class;

e) interchange format class;

f) ODA version date;

g) raster graphics content defaults.

Non-basic document characteristics:

a) page dimensions;

b) medium type;

c) raster graphics presentation features.

Document management attributes:

a) document description (only document reference supported).

The attributes applicable to the document profile are defined in Table D.3, Annex D.

7Specification of Constituent Constraints

7.1Document Profile Constraints

7.1.1Macro Definitions

```
-- General macros --
DEFINE(FDA, "{'formatted'}")

DEFINE(DAC, "DocumentProfile (Document-architecture-class)")

DEFINE(FPR,"ASN.1{2 8 2 7 2}")  -- Raster formatted processable
                                --

-- Basic page dimensions. --
DEFINE(BasicPageDimension,"
{REQ #horizontal-dimension {REQ #fixed-dimension { <=40800 }},
 REQ #vertical-dimension {REQ #fixed-dimension { <=52800}}}
 --  Any size equal to or smaller than the actual page size of
            ISO A1 and ANSI E portrait.  --
 {REQ #horizontal-dimension {REQ #fixed-dimension { <=52800 }},
 REQ #vertical-dimension {REQ #fixed-dimension { <=40800 }}}
 --  Any size equal to or smaller than the actual page size of
```

```
                ISO A1 and ANSI E landscape.  --
                                ")

                -- Non-basic page dimensions. --
                 DEFINE(NonBasicPageDimensions,"
{REQ #horizontal-dimension {REQ #fixed-dimension {40801..48000}},
 REQ #vertical-dimension {REQ #fixed-dimension {52801..211200}}}
   --  Any size larger than the range of basic values in ANSI E
portrait and equal to or smaller than the       full size of ANSI
                          K portrait.  --
       | {REQ #horizontal-dimension {REQ #fixed-dimension
                         {52801..211200}},
  REQ #vertical-dimension {REQ #fixed-dimension {40801..48000}}}
   --  Any size larger than the range of basic values in ANSI E
  landscape and equal to or smaller than       the full size of
                       ANSI K landscape.  --
    | {REQ #horizontal-dimension {REQ #fixed-dimension {13200}},
     REQ #vertical-dimension {REQ #fixed-dimension {>= 16801}}}
      --  Any portrait size larger than the typical foldout size
           (11in x 14in) including 11 inch roll paper.  --
  | {REQ #horizontal-dimension {REQ #fixed-dimension {>= 16801}},
       REQ #vertical-dimension {REQ #fixed-dimension {13200}}}
      --  Any landscape size larger than the typical foldout size
             (14in x 11in) including 11 in. roll paper --
                                ")

                      DEFINE(NominalPageSizes,"

                         -- ISO Page Sizes --
                    {REQ #horizontal-dimension {7015},
     REQ #vertical-dimension {9920}     --  ISO A5 Portrait -- }
                  | {REQ #horizontal-dimension {9920},
     REQ #vertical-dimension {7015}     --  ISO A5 Landscape -- }
                  | {REQ #horizontal-dimension {9920},
     REQ #vertical-dimension {14030}    --  ISO A4 Portrait -- }
                 | {REQ #horizontal-dimension {14030},
     REQ #vertical-dimension {9920}     --  ISO A4 Landscape -- }
                  | {REQ #horizontal-dimension {14030},
     REQ #vertical-dimension {19843}    --  ISO A3 Portrait -- }
                  | {REQ #horizontal-dimension {19843},
     REQ #vertical-dimension {14030}    --  ISO A3 Landscape -- }
                  | {REQ #horizontal-dimension {19843},
     REQ #vertical-dimension {28063}    --  ISO A2 Portrait -- }
                  | {REQ #horizontal-dimension {28063},
     REQ #vertical-dimension {19843}    --  ISO A2 Landscape -- }
                  | {REQ #horizontal-dimension {28063},
     REQ #vertical-dimension {39732}    --  ISO A1 Portrait -- }
                  | {REQ #horizontal-dimension {39732},
     REQ #vertical-dimension {28063}    --  ISO A1 Landscape -- }
```

```
              | {REQ #horizontal-dimension {39732},
   REQ #vertical-dimension {56173}    --  ISO A0 Portrait -- }
              | {REQ #horizontal-dimension {56173},
  REQ #vertical-dimension {39732}    --  ISO A0 Landscape -- }

                      -- ANSI Page Sizes --

              | {REQ #horizontal-dimension {10200},
   REQ #vertical-dimension {13200}    --  ANSI A Portrait -- }
              | {REQ #horizontal-dimension {13200},
  REQ #vertical-dimension {10200}    --  ANSI A Landscape -- }
              | {REQ #horizontal-dimension {10200},
 REQ #vertical-dimension {16800}    --  ANSI Legal Portrait -- }
              | {REQ #horizontal-dimension {16800},
REQ #vertical-dimension {10200}    --  ANSI Legal Landscape -- }
              | {REQ #horizontal-dimension {13200},
   REQ #vertical-dimension {20400}    --  ANSI B Portrait -- }
              | {REQ #horizontal-dimension {20400},
  REQ #vertical-dimension {13200}    --  ANSI B Landscape -- }
              | {REQ #horizontal-dimension {20400},
   REQ #vertical-dimension {26400}    --  ANSI C Portrait -- }
              | {REQ #horizontal-dimension {26400},
  REQ #vertical-dimension {20400}    --  ANSI C Landscape -- }
              | {REQ #horizontal-dimension {26400},
   REQ #vertical-dimension {40800}    --  ANSI D Portrait -- }
              | {REQ #horizontal-dimension {40800},
  REQ #vertical-dimension {26400}    --  ANSI D Landscape -- }
              | {REQ #horizontal-dimension {40800},
   REQ #vertical-dimension {52800}    --  ANSI E Portrait -- }
              | {REQ #horizontal-dimension {52800},
  REQ #vertical-dimension {40800}    --  ANSI E Landscape -- }
              | {REQ #horizontal-dimension {33600},
   REQ #vertical-dimension {48000}    --  ANSI F Portrait -- }
              | {REQ #horizontal-dimension {48000},
  REQ #vertical-dimension {33600}    --  ANSI F Landscape -- }
              | {REQ #horizontal-dimension {13200},
   REQ #vertical-dimension {108000}   --  ANSI G Portrait -- }
             | {REQ #horizontal-dimension {108000},
  REQ #vertical-dimension {13200}    --  ANSI G Landscape -- }
              | {REQ #horizontal-dimension {33600},
   REQ #vertical-dimension {171600}   --  ANSI H Portrait -- }
             | {REQ #horizontal-dimension {171600},
  REQ #vertical-dimension {33600}    --  ANSI H Landscape -- }
              | {REQ #horizontal-dimension {40800},
  REQ #vertical-dimension {211200}    --  ANSI J Portrait -- }
             | {REQ #horizontal-dimension {211200},
  REQ #vertical-dimension {40800}    --  ANSI J Landscape -- }
              | {REQ #horizontal-dimension {48000},
   REQ #vertical-dimension {171600}   --  ANSI K Portrait -- }
```

```
            | {REQ #horizontal-dimension {171600},
 REQ #vertical-dimension {48000}    --  ANSI K Landscape -- }

                        -- Foldouts --

              | {REQ #horizontal-dimension {13200},
 REQ #vertical-dimension {16800}    --  Foldout Portrait -- }
              | {REQ #horizontal-dimension {16800},
 REQ #vertical-dimension {13200}    --  Foldout Landscape -- }
            | {REQ #horizontal-dimension {13200},
              REQ #vertical-dimension {>= 16801}
     --  Any portrait size larger than the typical foldout size
         (11in x 14in) including 11 inch roll paper --
           | {REQ #horizontal-dimension {>= 16801},
             REQ #vertical-dimension {13200}
    --  Any landscape size larger than the typical foldout size
         (14in x 11in) including 11 inch roll paper --
                           ")
```

7.1.2Constituent Constraints

7.1.2.1DocumentProfile

```
                              {

            -- Presence of document constituents --

          REQSpecific-layout-structure{'present'},
            PERMPresentation-styles{'present'},

              -- Document characteristics --

REQDocument-application-profile{-- See clause 8 for a definition
        of the permitted values for this attribute. --},

          REQDocument-application-profile-defaults{

            -- Document architecture defaults --

           REQ#content-architecture-class{$FPR},
          PERM#dimensions{$BasicPageDimensions  |
                $NonBasicPageDimensions},
                    PERM#medium-type{
        PERM  #nominal-page-size{$NominalPageSizes},
              PERM  #side-of-sheet{ANY_VALUE}},

-- Any permitted medium type. Both landscape and portrait may be
```

```
                    specified. --

    REQ#type-of-coding{ASN.1 {2 8 3 7 0} -- T6 encoding --
          | ASN.1 {2 8 3 7 5} -- tiled encoding -- },
               PERM#page-position{ANY_VALUE},
          PERMraster-graphics-contents-defaults{
               PERM  #pel-path{ANY_VALUE},
            PERM  #line-progression{ANY_VALUE},
          PERM  #pel-spacing{REQ #length {6 | 4},
                  REQ #pel-spaces {1}},
                   PERM  #spacing-ratio
           {REQ  #line-spacing-value{ANY_VALUE},
            REQ  #pel-spacing-value{ANY_VALUE}},
      PERM  #compression{'compressed' | 'uncompressed'},
               PERM  #clipping{ANY_VALUE}},

           REQDocument-architecture-class{$FDA},
          REQ Content-architecture-classes{$FPR},
REQInterchange-format-class{-- See clause 8 for a definition of
        the permitted Values for this attribute. --},
                    REQODA-version
        {REQ #standard-or-recommendation {'ISO 8613'},
            REQ #publication-date{"1989-07-04"}},

          -- Non-basic document characteristics --

      PERMPage-dimensions{PMUL {$NonBasicPageDimensions}},
                  PERMMedium-types{PMUL{
        PERM#nominal-page-size{$NominalPageSizes},
            PERM#side-of-sheet{ANY_VALUE}}},
               PERMPresentation-features{
     PERM  #Raster-graphics-presentation-features    {
               PMUL#pel-path{'180-degrees' |
                     '270-degrees'},
           PERM#line-progression{'90-degrees'},
      PMUL#pel-spacing{REQ #length {ANY_EXCEPT 6, 4},
            REQ #pel-spaces {ANY_EXCEPT 1}},
                  PMUL#spacing-ratio
          {REQ #line-spacing-value{ANY_EXCEPT 1},
          REQ #pel-spacing-value{ANY_EXCEPT 1}}}},



           -- Document management attributes --

               -- Document description --
            REQ  Document-reference{ANY_VALUE}

                          }
```

7.2Logical Constituent Constraints

No logical constituents applicable in this clause.

7.3Layout Constituent Constraints

7.3.1 Macro Definitions

```
DEFINE(RAST,"  CONTENT_ID_OF(RASTER)")
```

7.3.2 Factor Constraints

```
FACTOR:    ANY-LAYOUT          {

SPECIFIC:
PERM Object-type                    {VIRTUAL},
PERM Object-identifier              {ANY_VALUE},
PERM Subordinates                   {VIRTUAL},
PERM User-visible-name              {ANY_VALUE},
PERM User-readable-comments         {ANY_VALUE},
}
```

7.3.3 Constituent Constraints

7.3.3.1 DocumentLayoutRoot

```
DocumentLayoutRoot:       ANY-LAYOUT      {

SPECIFIC:
REQ  Object-type                    { 'document-layout-root'},
REQ  Subordinates                   {SUB_ID_OF(CompositePage)+}
}
```

7.3.3.2 CompositePage

```
CompositePage:            ANY-LAYOUT      {

SPECIFIC:
REQ  Object-type                    {'composite-page'},
REQ  Subordinates                   {SUB_ID_OF(ImageFrame)},
PERM Dimensions                     {REQ #horizontal-dimension
                                    {REQ    #fixed-dimension
```

```
                                        {$BasicPageDimensions    |
                                        $NonBasicPageDimensions}},
                                   REQ #vertical-dimension
                                        {REQ    #fixed-dimension
                                        {$BasicPageDimensions    |
                                        $NonBasicPageDimensions}}},
PERM Page-position                      {ANY_VALUE},
PERM Medium-type                        {PERM    #nominal-page-size
{$NominalPageSizes},
                                    PERM #side-of-sheet {ANY_VALUE}},
PERM Application-comments                    {ANY_VALUE}
}
```

7.3.3.3 ImageFrame

```
ImageFrame:                ANY-LAYOUT    {

SPECIFIC:
REQ  Object-type                        {'frame'},
REQ  Subordinates                       {SUB_ID_OF(SpecificBlock)},
PERM Application-comments                    {ANY_VALUE}
}
```

7.3.3.4 SpecificBlock

```
SpecificBlock:                {

SPECIFIC:
REQ  Object-type                        {'block'},
REQ  Object-identifier                  {ANY_VALUE},
REQ  Content-portions                   {$RAST},
PERM Content-architecture-class              {$FPR},
PERM User-readable-comments             {ANY_STRING},
PERM User-visible-name                  {ANY_STRING},
PERM Application-comments                    {ANY_VALUE},
                          -- See clause 8.1.3 and 8.2.3 --
PERM Presentation-style                 {STYLE_ID_OF(PStyle)},
          -- PStyle for raster content --
PERM Presentation-attributes                 {
     PERM  #raster-graphics-attributes            {
          PERM      #pel-path                {ANY_VALUE},
          PERM      #line-progression        {ANY_VALUE},
          PERM      #pel-spacing             {ANY_VALUE},
          PERM      #spacing-ratio           {REQ  #line-spacing-value
{ANY_VALUE},
                                        REQ #pel-spacing-value {ANY_VALUE}},
          PERM      #clipping                {ANY_VALUE}}}
```

```
}
```

7.4 Layout Style Constraints

```
No layout style constraints applicable in this clause.
```

7.5 Presentation Style Constraints

7.5.1 Macro Definitions

No macro definitions are applicable to this clause.

7.5.2 Factor Constraints

```
FACTOR:   ANY-PRESENTATION-STYLE   {

REQ  Presentation-style-identifier      {ANY_VALUE},
PERM User-readable-comments        {ANY_STRING},
PERM User-visible-name             {ANY_STRING}
}
```

7.5.3 Presentation Style Constituent Constraint

7.5.3.1 PStyle

```
PStyle:        ANY-PRESENTATION-STYLE    {

     -- This style is used for raster graphics content --

PERM  Presentation-attributes                {
     PERM  #raster-graphics-attributes       {
          PERM      #pel-path           {ANY_VALUE},
          PERM      #line-progression   {ANY_VALUE},
          PERM      #pel-spacing        {REQ #length {ANY_VALUE},
                                   REQ #pel-spaces {ANY_VALUE}},
          PERM      #spacing-ratio      {REQ  #line-spacing-value
{ANY_VALUE},
                                   REQ #pel-spacing-value {ANY_VALUE}},
          PERM      #clipping           {ANY_VALUE}}}
}
```

7.6 Content Portion Constraints

7.6.1 Macro Definitions

DEFINE(TILED," ASN.1{2 8 3 7 5}") -- Tiled raster encoding --

7.6.2 Factor Constraints

No factor constraints are applicable to this clause.

7.6.3 Content Portion Constraints

7.6.3.1 Raster Graphics Content Portion

```
Raster-graphics-content-portion:          {
PERM Content-identifier-layout            {CONTENT_ID_OF(RASTER)},
PERM Coding-attributes                 {
     PERM Compression                  {ANY_VALUE},
     REQ  Number-of-lines              {>0},
     REQ  Number-of-pels-per-line           {>0},
     PERM Type-of-coding               {ASN.1{2  8  3  7  0}    --  T.6
encoding --
                                      |ASN.1{2 8 3 7 3} -- bitmap encoding
--
                                      | ASN.1{2 8 3 7 5} -- tiled encoding
--},
     CASE Raster-graphics-content-portion (Type-of-coding) OF {

     $TILED:   PERM Number-of-pels-per-tile-line  {512},
               PERM Number-of-lines-per-tile      {512},
               PERM Tiling-offset                      {ANY_VALUE},
               PERM Tile-types                         {'null background' |
                                                  'null foreground' |
                                                  'T.6 encoded' |
                                                  'bitmap encoded'}}},
PERM Alternative-representation           {ANY_STRING},
PERM Content-information                  {RASTER}
}
```

7.7 Additional Usage Constraints

No other usage constraints are currently defined.

8 Interchange Format

Two interchange formats are supported by this profile. The Interchange Format Class A can be used by applications requiring a binary encoding based on ASN.1. The Interchange Format SDIF can be used by applications requiring a SGML based clear text encoding. This latter interchange format is an SGML application, called Office Document Language (ODL). For the purposes of interchange, the ODL ENTITIES are placed in an ASN.1 wrapper, as defined by SDIF. Each encoding form has inherent advantages. Conversion of document encoded in one interchange format into the other should not produce the loss of semantic document information.

8.1 Interchange Format Class A

8.1.1 Interchange Format

The value of the document profile attribute "interchange format" for this interchange format is "if-a". This form of ODIF is defined in ISO 8613-5.

The encoding is in accordance with the Basic Encoding Rules for Abstract Syntax Notation One (ASN.1), as defined in ISO 8825.

8.1.2 DAP Identifier

The value for the document profile attribute "Document application profile" for this interchange format is represented by the following object identifier.

Editor's Note - To be supplied.

8.1.3 Encoding of Application Comments

ISO 8613-5 define the encoding of the attribute Application Comments as an octet string. For SpecificBlock, this DAP requires that the encoding within that octet string be in accordance with the ASN.1 syntax specified in the following module definition.

```
NISTDAPSpecification
DEFINITION                    ::=  BEGIN
EXPORTS Object-Appl-Comm-Encoding;

Object-Appl-Comm-Encoding  ::=  IMPLICIT SEQUENCE OF
                      INTEGER
```

```
END
```

8.2 Interchange Format SDIF

8.2.1 Interchange Format

The document profile attribute "Interchange format" does not apply for this interchange format. The SDIF encoding of ODA is defined in Annex E of ISO 8613-5. In addition, ISO 8613-6, -7, and -8 contain additional specifications for this encoding of ODA.

8.2.2 DAP Identifier

The value for this attribute "Document application profile" for this interchange format is represented by the following object identifier.

Editor's Note - To be supplied.

8.2.3 Encoding of Application Comments

For SpecificBlock, the encoding of the attribute "Application comments" is defined in a data stream conforming to this profile with the following DTD definition:

```
<!DOCTYPE odaac [
<!--
<!DOCTYPE doc PUBLIC "-//USA-OIW//SGML ENCODED ODA APPLICATION
COMMENTS//EN"> -->

<!ELEMENT objappc   - O (#PCDATA)>
     <!-- Object application comment -->
]>
```

Editor's Note - The above DTD definitions must be verified by a SGML expert and modified as required.

8.3 Encoding of Raster Content Information

The encoding of raster content information in the bitmap encoding scheme is that specified in clause 9.3 of the raster graphics content architecture part of ISO 8613-7, that is, the first pel in the order of bits is allocated to the most significant bit of an octet. The encoding of the code words in the Group 4 facsimile encoding scheme is such that the first or only bit of the first code word shall be placed in the least significant bit of the first octet. Subsequent bits of the first and following code words are placed in the direction of more significant bits in the first and following octets.

Annex A (normative)

Amendments and Corrigenda

A.1 Amendments

A.1.1 Amendments to the base standard

The amendments applicable to this DAP includes the ISO 8613 - Amendment 1: 1990. This amendment includes text to be included in ISO 8613-1 as the following annexes:

a) Annex E: Use of ISO/IEC 10021 (MOTIS) to interchange documents conforming to ISO 8613;

b) Annex F: Document application profile proforma and notation;

c) Annex G: Conformance testing methodology;

d) Annex H: Recording of documents conforming to ISO 8613 on flexible disk cartridges conforming to ISO 9293.

In addition, this amendment addresses the inclusion of the ISO 8613 Technical Corrigenda 1.

This DAP does not include the following features of the amendment:

a) Addendum on security;

b) Addendum on styles;

c) Addendum on alternative representation.

Additionally, this DAP includes features from the Draft Addendum (DAD) to ISO 8613-7, Tiled Raster Graphics Addendum, dated January 1990. The DAD has been balloted and the disposition of all comments has been processed by ISO/IEC JTC1/SC 18/WG5. The document was distributed as a CCITT Study Group VIII document (CCITT/SGVIII/Q.27). A new ISO 8613-7 will be issued after the Colour Addendum is incorporated which is anticipated to be in March 1991.

A.2 Corrigenda

A.2.1 Corrigenda to this DAP

The first version of this document was approved at the June 1991 OIW meeting, consequently there are no corrigenda.

Annex B (informative)

Recommended Practices

B.1 Transfer methods for ODA

B.1.1 Conveyance of ODA over CCITT X.400-1984

This recommendation describes how ODA body parts are to be encoded for transmission over a CCITT X.400-1984 service.

An ODA body part is encoded as OdaBodyPart in the definition given below:

```
OdaBodyPart ::= SEQUENCE { OdaBodyPartParameters, OdaData }
OdaBodyPartParameters ::= SET {
        document–application–profile
                [0] IMPLICIT OBJECT IDENTIFER,
        document–architecture–class
                [1] IMPLICIT INTEGER {
                        formatted (0),
                        processable (1),
                        formatted–processable (2) }
OdaData ::=     SEQUENCE OF Interchange–Data–Element
```

NOTE - It is recommended to transfer an ODA document as a single body part with tag 12:

Oda [12] IMPLICIT OCTETSTRING

The content of the octet string is encoded as OdaBodyPart, defined above. However, this is out of the scope of this profile.

B.1.2 Conveyance of ODA over FTAM

This recommendation describes the FTAM Document Type to be used for minimal storage and transfer capabilities of ODA data streams. It is recognized that enhanced capabilities may at some point be added.

When using FTAM to transfer an ODA file, the FTAM-3, "ISO FTAM Unstructured Binary", document type should be specified. However, since files that do not contain ODA data streams can have the same document type, it is left up to the user of application programs that remotely access files using FTAM to know that a given file contains an ODA data stream.

B.1.3 Conveyance of ODA over DTAM

This recommendation provides for information concerning the interchange of ODA based documents with

DTAM (Document Transfer and Manipulation) protocols.

DTAM is defined in the T.430-Series of recommendations and is, like ODA, an integral part of the T.400-Series of CCITT Recommendations named *Open Document Architecture, Transfer and Manipulation*.

The T.520-Series of recommendations contain *Communication Application Profiles (CAP)*. Recommendation T.522 describes the Communication Application Profile BT1 for document bulk transfer. Recommendation T.522 is applicable for the Office Document Format Profile (FOD) published in this ISP.

> **NOTE -** The use of BT1 within the end-to-end oriented Telematic Services Telefax 4 and Teletex is described in Recommendation T.561, clause 7.1 and Recommendation T.562, clause 7.1.

B.1.4 Conveyance of ODA over flexible disks

The recommended method for interchanging ODA documents between systems by the exchange of magnetically recorded Flexible Disk Cartridges is by the use of an annex to ISO 8613-1 (to be published), *Recoding of Documents Conforming to ISO 8613 on Flexible Cartridges Conforming to ISO 9293*. This annex provides for recording each ODA document as a separate file as defined by ISO 9293, *Volume and File Structure of Flexible Disk Cartridges for Information Interchange*.

> **NOTE -** Document encoded in ODL can be stored such that each SGML ENTITY is recorded in a separate file or in the case of an SDIF encoding, the file can be stored in a single file.

B.2 Interoperability with SGML applications

The recommended method for the exchange of documents between Standard Generalized Markup Language (ISO 8879, SGML) based systems and systems based on this ODA document application profile is by means of exchanging a document representation conforming to these agreements in an encoded form of the SGML language known as the Office Document Language (ODL). ODL is a standardized SGML application for representing documents conforming to the ODA base standard. Such a representation can be converted into the Office Document Interchange Format (ODIF) supported by this document application profile.

Annex C (informative)

References to Other Standards and Registers

CCITT Recommendation T.400 : 1988, Introduction to Document Architecture, Transfer and Manipulation;

CCITT Recommendation T.411 : 1988, Open Document Architecture (ODA) and Interchange Format: Introduction and General Principles;

CCITT Recommendation T.412 : 1988, Open Document Architecture (ODA) and Interchange Format: Document Structures;

CCITT Recommendation T.414 : 1988, Open Document Architecture (ODA) and Interchange Format: Document Profile;

CCITT Recommendation T.415 : 1988, Open Document Architecture (ODA) and Interchange Format: Open Document Interchange Format;

CCITT Recommendation T.417 : 1988, Open Document Architecture (ODA) and Interchange Format: Raster Graphics Content Architecture;

CCITT Recommendation T.503 : 1984, Document Application Profile for the Interchange of Group 4 Facsimile Documents;

ISO 8571 : 1988, Information processing systems - Open Systems Interconnection - File transfer, access and management;

ISO 9070 : 1990, Information processing - SGML support facilities - Registration procedures for public owner identifiers;

ISO/TR 9573 : 1988, Information processing - SGML technical report - Techniques for using SGML;

ISO 10021 : (to be published), Information processing systems - Text communication - Message Oriented Text Interchange System;

ISP FOD26 : (to be published), Office document format profile for the interchange of enhanced function mixed content documents in processable and formatted forms;

ISP FOD36 : (to be published), Office document format profile for the interchange of extended function mixed content documents in processable and formatted forms;

MIL-R-28002A : 1990, MILITARY SPECIFICATION, RASTER GRAPHICS REPRESENTATION IN BINARY FORMAT, REQUIREMENTS FOR.

Annex D (informative)

Supplementary Information on Attributes

Table D.1 Content Coding Attributes

Attributes	Basic Values	Default Values	Non-Basic Values
Number-of-pels-per-line	any positive integer	None	None
Number-of-lines	any positive integer	None	None
Tiling-offset*	(any non-negative integer < 512, any non-negative integer < 512)	(0,0)	None
Tile-types*	T.6 encoded, bitmap encoded, null background, null foreground	T.6 encoded	None
Type-of-coding	T.6 encoding (untiled), bitmap (untiled), tiled	T.6 encoding	None

Tutorial Note - * Only used if Type-of-coding is "tiled"

Table D.2 Presentation Attributes

Attributes	Basic Values	Default Values	Non-Basic Values
Pel-path	0, 90 deg	0 deg	180, 270 deg
Line-progression	270 deg	270 deg	90 deg
Pel-spacing	6 BMU (200), 4 BMU (300)	4 BMU (300)	5,3,2,1 BMU
Clipping	Two Coord. Pairs (any non-negative integer, any non-negative integer)	(0,0), (N-1, L-1)	None

Table D.3 Document Profile Attributes

Attribute	Class	Permissible Values
Specific-layout-structure	m	present
Presentation-styles	nm	present
Document-characteristics	M	
Document-architecture-class	m	formatted
Document-application-profile	m	{-- See clause 8 for a definition of the permitted values for this attribute. --}
Content-architecture-classes	m	{2 8 2 7 2}
Interchange-format-class	m	A
ODA-version	m	ISO 8613, 1989-07-04
Document-architecture-defaults	M	
Content-architecture-class	m	formatted processable raster graphics
Type-of-coding	nm	T.6 Encoding (default) Tiled Encoding
Page-dimensions	nm	See list in table 1, (Default value is NA-A, 9240 x 13200 BMU)
Medium-types	nm	See list in table 1, (Default value is NA-A, 9240 x 13200 BMU)
Page-position	nm	any coordinate pair within page
Raster-gr-content-defaults	NM	
Pel-path	nm	0, 90, 180, 270 degrees (0 is normal default)
Line-progression	nm	90, 270 degrees (270 is normal default)
Clipping	nm	any coordinate pair within page
Pel-spacing	nm	6 BMU (200 pels/in.), 5 BMU (240 pels/in.), 4 BMU (300 pels/in.), 3 BMU (400 pels/in.), 2 BMU (600 pels/in.), 1 BMU (1200 pels/in.), (Normal default is 4 BMU)
Non-basic-doc-characteristics	NM	
Page-dimensions	nm	See table 1, NA-F through NA-K, roll paper
Medium-types	nm	See table 1, NA-F through NA-K, roll paper
Raster-gr-presentation-features	NM	

Pel-path	nm	180, 270 degrees
Line-progression	nm	90 degrees
Pel-spacing	nm	5 BMU (240 pels/in.), 3 BMU (400 pels/in.), 2 BMU (600 pels/in.), 1 BMU (1200 pels/in.)
Document-management-attributes	M	
Document Reference	m	Any string of characters

The following notation is used in the class column of this table:

o m mandatory attribute
o nm non–mandatory attribute
o d defaultable attribute
Capital letters (M, NM, and D) are used for groups of attributes.