Ongoing Implementation Agreements for Open Systems Interconnection Protocols
Volume 1: Stable Virtual Terminal & Document Architecture and Interchange Format

Based on the Proceedings of the NBS/OSI Implementor's Workshop
Plenary Assembly Held May 6, 1988
National Bureau of Standards
Gaithersburg, MD 20899

Robert Rosenthal, Editor

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Institute for Computer Sciences and Technology
Gaithersburg, MD 20899

July 1988
ONGOING IMPLEMENTATION AGREEMENTS
FOR OPEN SYSTEMS INTERCONNECTION
PROTOCOLS
VOLUME 1:
STABLE VIRTUAL TERMINAL & DOCUMENT
ARCHITECTURE AND INTERCHANGE FORMAT

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ISO VIRTUAL TERMINAL PROTOCOL

1. INTRODUCTION

The NBS/OSI Workshop Virtual Terminal (VT) SIG is making implementation agreements for the OSI Basic Class VT Service and Protocol, 9040 and 9041, including the first addenda to both 9040 and 9041.

These implementation agreements fall into the following categories.

- Functionality to be implemented, i.e., functional units, etc.
- Identification and specification of VT profiles to be supported by conforming implementations.
- Agreements with regard to implementation issues not specified in ISO 9040 and 9041 and their addenda.
- Resolution of problems with ISO 9040 and 9041 identified during implementation.
- Statement of requirements to meet conformance to these agreements.

1.2 SCOPE AND FIELD OF APPLICATION

The TELNET profile is intended to support the following usage

- a simple line at a time or character at a time dialogue
- an application level gateway supporting TELNET/VT interoperation.

The Transparent profile supports the exchange of uninterpreted sequences of characters. This includes support of VT-users who wish to control terminals directly through the use of embedded control characters and escape sequences.

1.3 STATUS

This phase of the VT Agreements was completed May 5, 1988. No future enhancements will be made to this phase.
1.5 CONFORMANCE

Conformant VT implementations are required to support the 9041 Clause 13 requirements plus the additional conformance requirements identified below.

Figure 1.1 shows conformance status for VT facilities which are optional in the ISO VT standard. The terms used in the figure are defined as follows:

- "Mandatory" indicated the facility must be provided by all implementations which conform to these agreements.
- "Optional" indicates that the VT facility is not required to meet minimum conformance requirements but has been identified as providing additional useful capabilities.
- "Profile dependent" indicates that the requirement for the facility, if any, is included in the profile definitions.
- "Not addressed" indicates that the VT facility is outside the scope of these agreements.
<table>
<thead>
<tr>
<th>* Conformance Status</th>
<th>Optional</th>
<th>Mandatory</th>
<th>Profile Development</th>
<th>Not Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile Switch Functional Unit</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Interaction Negotiation Functional Unit</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Negotiated Release</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urgent Data</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Break</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery Control</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Enhanced Access Rules</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured COS</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Blocks Functional Unit</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fields Functional Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIOs</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-mode</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-mode</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1.1 Conformance Status for VT Facilities

It is not anticipated that new profiles will use quarantined delivery control.

For each mode of operation, (A-mode and S-mode) which is implemented, the default profile for that mode as defined in ISO 9040 must be supported. Implementations that support A-mode must support the A-mode default profile and at least one additional workshop approved A-mode profile. The Transparent profile does not count as an additional A-mode profile. Implementations that support S-mode must support the S-mode default profile and at least one additional workshop approved S-mode profile.
For each profile implemented, VTE parameter ranges or values specified in that workshop agreed profile and associated notes must be supported.

1.6 PROTOCOL

1.6.1 Protocol Elements

All Protocol Elements supported by the Switch Profile Negotiation and Break functional units have been selected.

1.6.2 Mapping of Protocol Elements

Mapping of protocol elements on to underlying ACSE or Presentation Services is as defined in ISO 9041.

1.6.3 Protocol Data Unit Structure

Protocol data unit structure is as defined in ISO 9041.

1.7 TELNET PROFILE

This profile provides support for TELNET-like operation for users of the ISO Virtual Terminal Service. It is based on the second DIS version of the ISO 9040 and 9041 documents. The profile has the following arguments:

1. Which is used to represent the line length as the value of VTE parameter x-window for both display objects. This argument is mandatory and takes a nonnegative integer value. This argument is identified by the identifier for x-window for display object D.

2. Which is used to designate the default repertoire for both display objects. This argument is optional, if not present the full US ASCII set is the default. This parameter is identified by the identifier for repertoire assignment for the display object D.

The profile is defined as follows:

Display-objects=
 {
     display-object-name=D,* (DISPLAY)*
do-access="WAC", *(the association is initiated by the "terminal"VT-USER)*
dimensions="two",
x-dimension=
{
  x-bound="unbounded",
  x-addressing="no constraint",
  x-absolute="no",
  x-window=r1
},
y-dimension=
{
  y-bound="unbounded",
  y-addressing="higher only",
  y-absolute="no",
  y-window=0
},
repertoire-capability=2,
repertoire-assignment=profile-argument-r2,
  *(optional; default=\{<ESC>2/8 4/2,"void"<ESC>2/1 4/0\}
  full ASCII 7-bit (G0+C0) )*
repertoire-assignment=\{<ESC>2/5 2/15 4/2,
  *(Virtual Terminal Service Transparent Set, used for
  "binary" TELNET option, always available)"
},
{
  display-object-name=K, *(KEYBOARD) *
  do-access=\"WACI\",
  dimensions="two",
  x-dimension=
  {
    x-bound="unbounded",
    x-addressing="no constraint",
    x-absolute="two",
    x-window=r1
  },
  y-dimension=
  }
  y-bound="unbounded",
  y-addressing="higher only",
  y-absolute="no",
  y-window=0
},
repertoire-capability=2,
repertoire-assignment=profile-argument-r2,
  *(optional; default=\{<ESC>2/8 4/2,"void"<ESC>2/1 4/0\}
  full ASCII 7-bit (G0+C0) )*
repertoire-assignment=\{<ESC>2/5 2/15 4/2,
  *(Virtual Terminal Service Transparent Set, used for
  "binary" TELNET option, always available)"
},
},
Control-object=

1-5
{
  {
    co-name=SY, *(SYNCHRONIZE) *
    co-access="not-subject-to-access-control",
    co-category="boolean",
    co-size=1,
    co-priority="urgent",
    co-trigger="selected",
  },
  {
    co-name=DI, *(DISPLAY-SIGNAL) *
    co-access="WACA",
    co-category="boolean",
    co-size=5,
    co-priority="normal",
    co-trigger="selected"
  }
  {
    co-name=KB, *(KEYBOARD-SIGNAL) *
    co-access="WACA",
    co-category="boolean",
    co-size=5,
    co-priority="normal",
    co-trigger="selected"
  }
  {
    co-name=NI, *(negotiation control object for initiator) *
    co-access="WACA",
    co-category="boolean",
    co-size=4,
    co-priority="normal",
    co-trigger="selected"
  }
  {
    co-name=NA, *(negotiation control object for acceptor) *
    co-access="WACA",
    co-category="boolean",
    co-size=4,
    co-priority="normal",
    co-trigger="selected"
  }
  {
    co-name=GA, *(go ahead) *
    co-access="not subject to access control",
    co-category="boolean",
    co-size=1
    co-priority="normal"
    co-trigger="selected"
  }
  },
{ 
    device-name=DISPLAY-DEVICE,
    device-display-object=D,
    device-default-CO-initial-value="true",*("on")*
    device-minimum-X-array-length=1,* (no constraint) *
    device-minimum-Y-array-length=1,* (no constraint) *
    device-control-object={SY,NA,DI},
        *(SYNC,NEGOTIATE-ACCEPTOR,DISPLAY-SIGNAL) *
    device-termination-event-list=NULL,
    device-default-CO-access="WACA",
    device-default-CO-priority="normal"
    *(other device parameters assume corresponding DO values)*
},

{ 
    device-name=KEYBOARD-DEVICE,
    device-display-object=K,
    device-default-CO-access="WACI",
    device-default-CO-priority="normal"
    device-default-CO-initial-value="true",*("on")*
    device-minimum-X-array-length=1,* (no constraint) *
    device-minimum-Y-array-length=1,* (no constraint) *
    device-control-object={SY,NI,KB},
        *(SYNC,NEGOTIATE-INITIATOR,KEYBOARD-SIGNAL) *
    device-termination-event-list=NULL
    *(other device parameters assume corresponding DO values)*
}

},

Type of delivery control = simple-delivery-control.

Notes:

1. Users of this profile should refer to the TELNET specification (MIL-STD-1782) and RFCs 854 and 855 for semantics of the TELNET commands. These documents can be obtained by contacting SRI International, DDN Network Information Center, 333 Ravenswood Ave., Menlo Park, CA 94025, (415) 859-3695.

2. This profile can be used only in A-mode.

3. Booleans in the KB and DI control objects are used in this profile to correspond to TELNET commands as follows:

<table>
<thead>
<tr>
<th>Control Object</th>
<th>Boolean</th>
<th>TELNET</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI/KB</td>
<td>1</td>
<td>IP</td>
</tr>
<tr>
<td>DI/KB</td>
<td>2</td>
<td>AO</td>
</tr>
<tr>
<td>DI/KB</td>
<td>3</td>
<td>AYT</td>
</tr>
<tr>
<td>DI/KB</td>
<td>4</td>
<td>DM</td>
</tr>
<tr>
<td>DI/KB</td>
<td>5</td>
<td>BREAK</td>
</tr>
</tbody>
</table>
The equivalent of a TELNET command is achieved by sending a control object update toggling the boolean that corresponds to the desired TELNET command.

4. An update to the GA control object is equivalent to the TELNET Go Ahead command.

5. The equivalent of a TELNET SYNCH command is achieved by updating the SY control object and immediately updating the DI (or KB) control object with the DM boolean set "true". IP, AO, AYT, or BREAK commands may be accompanied by a SYNCH command by updating the SY control object and then updating the DI or KB control object toggling both the DM and the other desired boolean. When an update to the SY control object is received subsequent display object updates are discarded until an update to the DI or KB control object is received toggling the DM bit. If a VT-BREAK is received after an SY CO update has been received and prior to the corresponding DI or KB CO update toggling the DM boolean, the discarding of updates is terminated. This is necessary because the VT BREAK may have caused the DI of KB CO update to be purged.

6. The TELNET EC (erase character) command will be mapped to a pointer relative (x: = x-1) update and an erase current update. The TELNET EL (erase line) command should be mapped to an erase-full-x-array update. (an erase operation where the extent is defined as start-x, current) and a pointer update to set x = 1.

7. The NI and NA control objects are used to emulate the TELNET option negotiation facility. The facility is symmetric, allowing either party to open negotiation for a change of mode, and every negotiation must be accepted or rejected by the opposite party. The rules for negotiation for each of the option controls are as stated in RFC 854:
   a. Only open negotiation for a change from the current state.
   b. Only acknowledge negotiation for a change from the current state.
   c. Do not send any other object updates with a negotiation outstanding.

For full symmetry, both the NI and NA control objects have the same value and consist of 4 booleans with the following semantics:

<table>
<thead>
<tr>
<th>BIT</th>
<th>Option Control</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remote Echo</td>
<td>&quot;False&quot; Echo is local; &quot;true&quot; echo remote</td>
</tr>
</tbody>
</table>
Booleans 3 and 4 control the use of the Transparent repertoire for the D and K display objects respectively. A value of "true" indicates the use of the binary repertoire; "false" indicates the use of the negotiated repertoire. When a party wants to change a repertoire assignment, it must complete a successful TELNET negotiation to change the option control. Then the party with the access rights to the display object in question is required to perform the corresponding secondary attribute model update.

8. No termination event list is specified so that data buffering and delivery can be controlled according to context. If local echoing is enabled, the local newline or enter event shall trigger a VT-DELEVER request. With remote echo a timeout or buffer length may be used to trigger a VT-DELEVER request. This buffer length may be 1.

9. The VT next x-array update will be sent in place of the TELNET NVT "CR,LF" sequence.

10. Option negotiation in TELNET can take place at any time during a session and modifies option settings one at a time. As Multiple Interaction Negotiation is not required by the NBS/OSI Implementor's Agreements, negotiation of TELNET options other than echo, character set, and the use of go-ahead is not supported by this profile.

11. In addition to constraints presented by VIE parameters, this profile permits only backward explicit addressing for the pointer dimension of both display objects. The x address of the pointer can be moved forward only by implicit pointer addressing. Addressing of the y dimension is limited to the next x-array operation.

12. While the "binary" repertoire is being used no mapping to pointer addressing or erase operations will be done.

13. The repertoire designation "7-bit ASCII (CO and GO)" refers to the repertoire invoked by ISO 2022 defined character set designating escape sequences <ESC> 2/8 4/2, "void", <ESC> 2/1 4/0. The repertoire designation "7-bit ASCII (GO only)" refers to the repertoire invoked by the ISO 2022 defined character set designating escape sequence <ESC> 2/8 4/2. The designation "binary" refers to the "Virtual Terminal Service Transparent Set" registered in the International Register under ISO 2375 and invoked by the escape sequence <ESC> 2/5 2/15 4/2.
14. If the "go ahead" has been negotiated then following a VT-BREAK, only the association acceptor has the right to send data. In the event of VT-BREAK the echo control objects are reinitialized to "false", meaning local echo. If remote echo is desired it must be re-negotiated following VT-BREAK.

CONFORMANCE

The following character sets are required:

- The GO character set for U.S. 7-bit ASCII (values 32-126)
- The full U.S. 7-bit ASCII (values 0-127)
- The transparent character set, (see Note 13).

1.8 TRANSPARENT PROFILE

This profile is intended to provide a transparent mode of operation which allows VT-users to exchange transparently uninterpreted sequences of characters but with the added benefit of delivery control to enable the VT-users to determine when the character sequences are to be delivered. This profile may be used when VT-users wish to control terminals directly through the use of embedded control characters.

Profile argument rl is optional and enables negotiation of a value for the VTE-parameter repertoire-assignment for the two display objects (which always have the same value of repertoire assignment when the profile is called). If omitted, the Virtual Terminal Transparent Set, ISO 2375 register value 125, is used as the default.

Display-objects *(double occurrence) *=

{display-object-name=DISPLAY-OBJECT-1,
do-access="WACA",
dimensions=1,
x-dimensions=
(x-addressing="no"*(no explicit motion)*
*(x-bound, x-absolute, and x-window assume default ),
* (erasure capability, emphasis-capability, foreground-colour-capability, background-colourcapability & repertoire-capability assume default values)*)
repertoire-assignment=profile-argument-r1
(display-object-name=DISPLAY-OBJECT-2,
do-access="WACT",
dimensions=1,
x-dimension=
(x-addressing="no"*(no explicit motion)*

1-10
*(x-bound, x-absolute, and x-window assume default values)*
)}

*(erasure-capability, emphasis-capability, foreground-colour-capability, background-colour-capability & repertoire-capability assume default values)*
っております-assignment=profile-argument-rl
})},

type-of-delivery-control=simple-delivery-control

1. Use of this profile requires that the value of service parameter VT-mode for the VT-association is "A-Mode".

2. This profile is intended primarily for applications requiring a simultaneous two way exchange of sequences of uninterpreted characters. The semantics usually associated with the display object are not used; for the purposes of this profile, the primary attributes of the character-box graphic elements are actually octets which are passed directly to the real device. There is no relationship between the elements of the X-array and the character boxes of the real device; the secondary attributes of the display object are not utilized. The only operation on the display object which must be supported is the text operation. An alternative repertoire may be selected.

3. Support for the default (transparent) character set is required. It is strongly recommended that the profile parameter not be used.
1.9 APPENDIX A

1.9.1 Specific ASE Requirement

For specific ASE Requirements identified by the Upper Layer SIG for Virtual Terminals, (See Volume 2 Ongoing Agreements Document, Continuing Agreements Chapter 9.10.)
2. OFFICE DOCUMENT ARCHITECTURE AND INTERCHANGE FORMAT

2.1 PART I - DOCUMENT ARCHITECTURE AND INTERCHANGE FORMAT

2.1.1 Introduction

Section 2 defines an Implementation Agreement based on Office Document Architecture (ODA) and Interchange Format, as defined in International Standard (ISO) 8613 and provides detailed specification for the implementor. (Note that throughout this agreement, references to ISO 8613 indicate the IS version, 1988). Such an agreement is termed a Document Application Profile according to ISO 8613.

ISO 8613 has seven parts:

Part 1 of the IS gives an introduction to the standard as a whole and provides a description of the general principles of ODA;

Part 2 defines the document structure model and a reference document processing model;

Part 4 defines the document profile;

Part 5 defines the interchange formats;

Part 6 defines the character content architectures;

Part 7 defines the raster graphics content architectures;

Part 8 defines the geometric graphics content architectures.

ISO 8613 is equivalent to the CCITT T.410 series of Recommendations. This Implementation Agreement uses ISO 8613 as the base standard.

2.1.2 Primary References

The following documents are referenced in the statement of the agreements relating to Office Document Architecture.

ISO 8613/1 - Information processing : Text and Office Systems; Office Document Architecture (ODA) and Interchange Format Part 1: Introduction and General Principles
ISO 8613/2 - Information processing: Text and Office Systems; Office Document Architecture (ODA) and Interchange Format Part 2: Document Structures

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

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

ISO 8613/6 - Information processing: Text and Office Systems; Office Document Architecture (ODA) and Interchange Format Part 6: Character Content Architectures

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

ISO 8613/8 - Information processing: Text and Office Systems; Office Document Architecture (ODA) and Interchange Format Part 8: Geometric Graphics Content Architectures

2.1.3 Additional References

ISO Standards

ISO 8859-1 - Information Processing - 8-bit Single-byte Coded Graphic Character Sets - Part 1: Latin Alphabet No. 1

ISO 8859-2 - Information Processing - 8-bit Single-byte Coded Graphic Character Sets - Part 2: Latin Alphabet No. 2

DIS 8859-3 - Information Processing - 8-bit Single-Byte Coded Graphic Character Sets - Part 3: Latin Alphabet No. 3

ISO 6937-1 - Information Processing - Coded Character Sets for Text Communication - Part 1: General Introduction

ISO 6937-2 - Information Processing - Coded Character Sets for Text Communication - Part 2: Latin Alphabetic and Non-Alphabetic Graphic Characters

ISO 2022 - Information Processing - ISO 7-Bit and 8-Bit Coded Character Sets - Code Extension Techniques


2-2


ISO 8632-4 - Information Processing Systems - Computer Graphics - Metafile for the Storage and Transfer of Picture Description Information - Part 4: Clear Text Encoding

ISO 646 - Information Processing - ISO 7-Bit Coded Character Set for Information Interchange

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

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

CCITT Recommendations

T.6 - Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus 1984

T.4 - Standardization of Group 3 Facsimile Apparatus for Document Transmission 1984

T.411 - Open Document Architecture (ODA) and Interchange Format - Introduction and General Principles 1988

T.412 - Open Document Architecture (ODA) and Interchange Format - Document Structures 1988

T.414 - Open Document Architecture (ODA) and Interchange Format - Document Profile 1988

T.415 - Open Document Architecture (ODA) and Interchange Format - Document Interchange Format (ODIF) 1988

T.416 - Open Document Architecture (ODA) and Interchange Format - Character Content Architectures 1988

T.417 - Open Document Architecture (ODA) and Interchange Format - Raster Graphics Content Architectures 1988
T.418 - Open Document Architecture (ODA) and Interchange Format - Geometric Graphics Content Architectures 1988

T.501 - Document Application Profile MM for the Interchange of Formatted Mixed Mode Documents 1988

T.502 - Document Application Profile PM1 for the Interchange of Processable Form Documents 1988

T.503 - Document Application Profile for the Interchange of Group 4 Facsimile Documents 1988

Other References

INTAP-S007-03 - Multi-media (ODA/ODIF) Functional Standard Detail Description (AE.111n-J), Small Function Set Profiles of Document Interchange Format with Layout Information

INTAP-S007-04 - Multi-media (ODA/ODIF) Functional Standard Detail Description (AE.112n-J), Medium Function Set Profiles of Document Interchange Format with Layout Information

Technical and Office Protocols (TOP) Version 3.0 Specification

2.1.4 SCOPE AND FIELD OF APPLICATION

This implementation agreement defines a document application profile (DAP) suitable for interchanging documents in formatted form, processable form, or formatted processable form in accordance with ISO 8613.

The DAP is intended for interchange of compound documents between document processing systems. It is intended for documents potentially containing character text, raster graphics, and geometric graphics.

The documents addressed by this DAP range from simple memos to highly structured technical documents. Other DAPs may be defined in the future for other levels of document processing requirements.

2.1.5 STATUS

This is the first version of the stable on-going agreement dated June 1988.
2.1.6 ERRATA

None.

2.1.7 CONFORMANCE

Introduction

This section defines conformance requirements and provides guidelines for the interpretation of results of conformance testing.

Conformance Requirements

Conformance to this document application profile is defined in terms of an implementation's ability to act as an originator and/or recipient of data streams conformant to the syntax and semantics of ISO 8613 as well as meet all the requirements listed below:

IF THE IMPLEMENTATION IS AN ORIGINATOR:

1) generate data streams, for one or more of the document architecture classes
   a) formatted document architecture (FDA)
   b) processable document architecture (PDA)
   c) formatted processable document architecture (FPDA)

2) for each document architecture class supported, generate data streams that include only constituents specified in the relevant sections of this implementation agreement.

3) for each constituent of each document architecture class supported, generate data streams that include only those attributes and combinations of attributes permitted by the relevant sections of this implementation agreement.

4) either
   i) for each attribute of each constituent of each document architecture class supported, generate data streams that contain only basic attribute values as specified by the relevant sections of this implementation agreement.
or

ii) for each attribute of each constituent of each document architecture class supported, generate data streams that contain both basic and non-basic attribute values as specified in the relevant sections of this implementation agreement.

IF THE IMPLEMENTATION IS A RECIPIENT :

5) receive data streams, for one or more of the document architecture classes
   a) formatted document architecture (FDA)
   b) processable document architecture (PDA)
   c) formatted processable document architecture (FPDA)

6) for each document architecture class supported, receive data streams that include any of the constituents specified in the relevant sections of this implementation agreement.

7) for each constituent of each document architecture class supported, receive data streams that include any of the attributes or any combination of attributes permitted by the relevant sections of this implementation agreement.

8) either

   i) for each attribute of each constituent of each document architecture class supported, receive data streams that contain only basic attribute values as specified by the relevant sections of this implementation agreement.

   or

   ii) for each attribute of each constituent of each document architecture class supported, receive data streams that contain both basic and non-basic attribute values as specified in the relevant sections of this implementation agreement.

Conformance Testing Definitions

Any implementation that can correctly generate data streams in
accordance with the conformance requirements listed above in 1), 2), 3) and 4)i, is defined as a "minimal conforming originator."

Any implementation that can correctly receive data streams in accordance with the conformance requirements listed above in 5), 6), 7), and 8)i, is defined as a "minimal conforming recipient."

2.2 PART II - NBS DOCUMENT APPLICATION PROFILE

2.2.1 Characteristics Supported by this DAP

The following sections describe the logical and layout features that can be represented in documents conforming to this document application profile. The features are described in terms that are typical of the user-perceived capabilities of current document processors. The features are grouped into logical features and layout features in order to relate them to their ODA representation.

Documents conforming to this document application profile may contain any or all of the following content architectures:

a) character text,
b) raster graphics,
c) geometric graphics.

2.2.1.1 Logical characteristics

Document logical structure

The logical structure of documents comprise numbered segments (e.g., chapters, sections or numbered paragraphs), passages, paragraphs, figures and footnotes. Numbered segments can be nested and automatic numbering systems are provided for.

The logical structure of a document conforming to this document application profile consists of a hierarchy of logical objects. The following is an example of a generic document logical structure derived from this document application profile:
Document
Passage (s)
Paragraph
Text
Footnote
  Footnote reference
  Footnote body
Text
Figure
Text
Figure
Section level 1
  Section number level 1
  Section title
  Passage
    Paragraph
    Figure
  Section level 2
  ....

Document structure elements

Document

A document is composed of a sequence of numbered segments or passages each of which is optionally titled and consists of a sequence of paragraphs and/or figures and/or further passages or numbered segments.

Passage

A passage consists of any logical sequence of paragraphs, figures, and/or further passages or numbered segments that can be regarded as an entity for reading or for layout presentation.

For example, separate passages may be provided for:

(a) the contents to be placed on the title page of a report,
(b) the body of the report, and
(c) the contents to be placed in appendices.

A table is a particular case of a passage. A single paragraph or a single figure is a simple case of a passage.

Segment
A segment is a part of a document which has an automatic number which precedes any other contents and which serves to identify the segment uniquely.

The contents of a segment may begin with a segment title starting on the same line as the segment number.

The document originator may define different classes of segments having in common some presentation features and/or some layout features. For example, the document originator may define a class of segments which always begin on a new page, and another class of segments which are laid out using a special left or right margin offset.

An automatically generated segment number consists of either a number or a series of numbers separated by instances of an arbitrary specified character string separator. In the case of a series of numbers, the segment number is equal to the automatically generated segment number (if any) of the enclosing segment followed by a single index number to uniquely identify the segment.

Index numbers are generated sequentially within any numbered segment. The method of numbering may be a combination of the following:

a) Arabic numerals  
b) Upper/lower case letters  
c) Upper/lower case Roman numerals

Paragraph

A paragraph is a contiguous amount of content in the intended reading order; a paragraph may, for example, contain a mixture of embedded figures, footnote references, and character text.

A paragraph may contain zero, one or more embedded footnote references. Multiple consecutive footnote references, without intervening text, are also permitted.

A paragraph may contain zero, one or more embedded figures and, optionally, figure references. Multiple consecutive figures and/or figure references, without intervening text, are permitted.

A paragraph may comprise a number of character sequences concatenated together, for example if the character sequences were separately derived or generated.

The document originator may define different classes of paragraphs having in common some presentation features.
and/or some layout features. For example, the document originator may define classes of paragraphs for "abstract", "standard paragraph", and "summary".

Figure

A figure is an amount of geometric graphics or raster graphics content designed to occupy a rectangular area.

One or more paragraphs can be associated with a figure, for example to provide captions or notes.

Footnote

A footnote consists of a footnote reference and a footnote body.

The footnote body is a contiguous amount of text that can be read out of sequence from the paragraph containing a reference to it.

Footnote reference

A footnote reference may have an automatically generated label or one supplied by the user. (Both types of footnote references may be present.) If the label is automatically generated then the label may be represented by Arabic numerals, upper or lower case Roman numerals, or upper or lower case alphabetic characters.

Automatically generated footnote numbers are incremented sequentially from an initial value which may be set to any non-negative value at the beginning of the document and reset at any segment or passage, as required.

Reference

A general purpose reference mechanism is provided within paragraph. For example, this reference may be used to reference figures, page numbers, chapter numbers, etc. in other parts of the document.

2.2.1.2 Layout characteristics

Document Layout Structure
The page layout structure allows for several pagesets (e.g., for introductory material and annexes in addition to the main text body, which could be in chapters.) The body area of a page may contain multiple columns and areas for graphics. Header and footer contents can also include figures.

The following is an example of a generic document layout structure derived from this document application profile:

```
Document
  Page set
    Page
      Header area
      Body area
        Single frame
        Multiple columns
        Individual frame(s)
        Mixed set of frames
      Footer area
    ....
```

Document layout structure elements

Document

A document consists of a sequence of one or more page sets.

Page set

The pages within a page set all have the same dimensions and orientation (landscape or portrait) but may differ in layout and/or content of the header and footer areas.

There may be an optional first page of one particular page layout and this may be followed by either of the following:

a) Repeated pages with the same layout
b) Repeated pages designed for alternating recto and verso layout

Page layout

This document application profile supports various page dimensions including the assured reproduction area of the ISO A4, North American Letter, North American Legal, and ISO A3. The default is the common assured reproduction area of ISO A4 which is equivalent to North American Letter.
A page layout consists of:

a) An optional header area that is reserved for header contents
b) A single body area
c) An optional footer area that is reserved for footer contents

Particular header and footer contents are associated with each page layout.

Body area layout

The body area may be subdivided into rectangular frames. Thus the layout may consist of any sequence of:

a) Single frame of fixed width, equal or less than body area width, and fixed height or height adjustable to fit contents
b) Set of multiple column frames of fixed widths per column and fixed height or height adjustable to fit contents
c) Individual frames with fixed position and dimensions
d) Mixed set of frames with various properties, e.g., fixed-size figure frame with fixed-sized caption frame beneath and adjustable height text frame beside both

See figure 1 for illustrations.

Frames which have fixed position and dimensions are permitted to overlap.

Header area layout

This is a rectangular area above the body area. It may be subdivided into a number of rectangular frames, for example to contain textual information and graphics such as company logos.
Figure 2.1 Examples of layout within body area

Footer area layout

This is a rectangular area below the body area. It may be sub-divided into a number of rectangular frames, for example to contain textual information and graphics such as company logos.
Header contents and footer contents

Header contents or footer contents may consist of a sequence of paragraphs and/or figures that are constrained to be laid out entirely within the corresponding header or footer area.

One or more automatically generated page numbers may be included anywhere within header contents and/or footer contents.

Header contents or footer contents must not include any footnote or footnote reference or automatic segment numbers.

Page numbering

An automatically generated page number may occur at any position within header contents or footer contents. Page numbers may represented in Arabic numerals, lower/upper case Roman numerals or lower/upper case letters.

Page numbers are generated sequentially and the sequence can be restarted from any positive integer value at the beginning of any page set.

Layout of document logical contents

The sequence of passages and/or segments is laid out in one or more body areas such that it flows through the sequence of pages in the document.

Controls are needed in order to break the flow of contents at appropriate points. For example, following the passages to be placed on the title page of a document it may be required to control the flow in order to direct subsequent text onto a new page of a different page layout.

Layout of passage (or segment) contents

A passage may be laid out in any of the following ways:

a) As separate passages (see below)
b) Below the previous text within a containing passage
c) As a sequence of passages

Layout of passage contents

Controls are available to guide the layout of passages or their subordinate paragraphs and figures.

A passage can be positioned at a fixed position (e.g. the
start) of a new body area or in a new frame below the previous contents of a body area.

In case of sets of multiple columns, content generally flows from the bottom of one column of the set to the top of the next column to the right.

Regardless of content type, the various paragraphs and figures in a passage may be laid out within specified frames.

The various methods of subdivision of body areas may be combined with certain frames being designated for flowing text and other frames for particular contents. Thus text may appear to flow around other contents. For example, several figures can be contained within a passage and effect of text flow around the figures and their captions can be produced. See figure 2 for illustration.

A new set of multiple frames can occur beneath a similar set. Thus parallel text (e.g., multilingual) can be synchronized or a table effect can be generated. See figure 3 for illustration.

A variation of the table technique can be used for labelling and annotating paragraphs.

A complete passage can be constrained to be contained in the same body area or frame (by indivisibility).

Layout controls

The following properties may be specified to control where body area or page breaks occur:

a) New column set (New Layout Object)

   This specifies that the contents should be laid out in the first column (or frame) of a new set of columns (or frames).

b) Unconditional column break (New Layout Object)

   This indicates that the contents must be displayed in the next column (or frame).
Figure 2.2 Example of text flow around figure

Note: "Caption" and "Notes" contain formatted character content.
c) Layout object class

This indicates that the contents concerned must be displayed in a specified frame, e.g., to control figure positioning.

d) New page set (New Layout Object)

This indicates that the contents should be laid out in a new page set.

e) New page layout (New Layout Object)

This indicates that the contents should be laid out on a new page of a particular page layout.

f) Unconditional page break (New Layout Object)
This indicates that the contents must be displayed in the body area of the next page.

g) Indivisibility

This indicates that a passage (segment, paragraph or figure) must be laid out within a single frame, body area or page set.

h) Same page/same area (Same Layout Object)

This specifies that the start of a passage, numbered segment, paragraph, or figure, for example, must be laid out in the same frame or body area as the end of the previous content (for example, to keep a first paragraph with a title)

Layout of paragraph contents

A paragraph may or may not specify its own margins, alignment and tab stops. The indentation of the first line may be different from the remainder of the paragraph. The separation between successive paragraphs can be controlled.

Within a passage the contents of a paragraph may be laid out in two or more frames to allow text to flow around a figure. The figure may or may not be logically associated with that paragraph.

By using the widow and orphan features, layout of paragraphs can also be controlled in order to determine how a paragraph should be divided across two pages.

The orphan size specifies the minimum number of lines of text that must be allocated to the first body area or frame.

The widow size specifies the minimum number of lines of text that must be allocated to the last body area or frame when a paragraph is split over two or more body areas or frames.

Layout of figure contents

A figure may occur beneath the previous contents of a body area or frame or can be specified to occupy a particular frame.

Any paragraphs associated with the figure, for example, to provide captions or notes, can be positioned to occupy rectangular areas positioned above, below or beside the figure.

Layout of footnote contents
A footnote body may be placed at the bottom of a body area of a page and may or may not be constrained to be entirely in the same body area as the reference to it. If multiple footnotes occur in the same body area the corresponding footnote bodies can be placed in the body area in the same order as the reading order of their references.

2.2.1.3 Content Characteristics

A document may contain any of the following types of content:

- character text utilizing graphic characters as defined in ISO 6937 and ISO 8859 together with character presentation techniques defined in ISO 8613/6;

- raster graphics images encoded according to CCITT Recommendations T.4 and T.6 and in unencoded bitmap form; and

- geometric graphics images in accordance with the minimum capabilities of ISO 8632, each figure consisting of a single picture only.

2.2.2 TECHNICAL SPECIFICATION

2.2.2.1 Summary of Technical Specification

Overview

The NBS DAP, in accordance with ISO 8613, allows documents to be represented in the following forms:

- processable form, which facilitates the revision of a document by a recipient;

- formatted form, which facilitates the reproduction of a document as intended by the originator;

- formatted processable form, which facilitates the reproduction of a document as intended by the
originator or facilitates the revision of a document.

Specification of Constituents

This section specifies the required and optional constituents used for the representation of documents that conform to the NBS DAP.

Constituents specified as 'required' must occur in any document that conforms to the NBS DAP. Constituents listed as 'optional' may or may not be present in the document depending upon the requirements of the particular document.

Formatted Form Documents

Required Constituents

- a document profile
- layout object descriptions representing a specific layout structure

Optional Constituents

- layout object class descriptions representing a 'partial' generic layout structure
- presentation styles

Processable Form Documents

Required Constituents

- a document profile
- logical object class descriptions representing a 'complete' generic logical structure
- logical object descriptions representing a specific logical structure

Optional Constituents

- layout object class descriptions representing a 'complete' generic layout structure
- layout styles
- presentation styles
Required Constituents

- a document profile
- logical object class descriptions representing a 'complete' generic logical structure
- logical object descriptions representing a specific logical structure
- layout object class descriptions representing a 'complete' generic layout structure
- layout object descriptions representing a specific layout structure

Optional Constituents

- layout styles
- presentation styles

Notation and Constraints

Introduction

This section presents the notation used in the diagrams and tables which define the permissible structures and attribute values for this document application profile.

There are two sets of diagrams: one describing the logical structure and one describing the layout structure. There are six tables describing attribute value ranges for logical constituents, layout constituents, character content, raster graphics content, geometric graphics content, and the document profile.

Although the layout of these tables is similar, some differences exist. In general, constraints are expressed for constituents by listing an ODA attribute name together with a set of permissible values identified for those attributes required to be present in the interchanged stream and for those additionally permitted in the interchanged stream. For example,

content-architecture-class (cp|cfp)
specifies for a given constituent that the content-architecture-class attribute in this DAP may take one of the values character-processable or character-formatted-processable.

Attributes in the tables specifying values for the character, raster, and geometric content also specify BASIC, NON-BASIC, and DEFAULT values as well as detailing for which content architecture class the attribute may be specified. For example,

<table>
<thead>
<tr>
<th>select-graphic-rendition</th>
<th>BASIC</th>
<th>{0.7,9,10..19, 21..27,29}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>{NONE}</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>{0}</td>
</tr>
<tr>
<td></td>
<td>CLASS</td>
<td>{cf,cp,cfp}</td>
</tr>
</tbody>
</table>

specifies, for a given content-information attribute, that the select-graphic-rendition control function may be one or more of the basic values representing normal intensity (0), bold (1), faint (2), italicized (3), underlined (4) and so on; that no non-basic values may be specified; that the default is normal intensity (0); and that the control function may be specified for any of the character content architecture classes.

There are no non-basic values allowed for attributes in the logical and layout object and object class descriptions. The respective default values, when different from IS 8613, are specified in the document profile attribute "document application profile defaults." For example,

<table>
<thead>
<tr>
<th>dimensions</th>
<th>#{horizontal(#fixed(9240))} #vertical(#fixed(12400))</th>
</tr>
</thead>
</table>

specifies for the document profile attribute dimensions that the default values for the horizontal and vertical are equal to the common assured reproduction area of ISO A4 and North American Letter.

Notation

This section informally describes a meta-language used to define, in terms of a two-level grammar, the NBS notation used in the specification of this document application profile.

The first level provides production rules for the direct specification of attribute values whereas the second level grammar provides productions for the indirect specification
of the attributes "bindings", "generator for subordinates" and "content generator".

The notation used in this Implementation Agreement is an extension of the notation defined in Annex A of IS 8613/2.

Grammar Meta-Language

The grammars have a BNF-style that uses the following meta-language symbols:

`:=`
Used to specify that the string of symbols on the right-hand side is to be substituted for the non-terminal symbol on the left-hand side;

`->`
Used to indicate that the non-terminal symbol on the left-hand side evaluates to the string of symbols on the right-hand side;

`|`
Used to separate alternatives;

`<>`
Used as a pair of symbols to delimit a non-terminal symbol;

`<< >>`
Used as a pair of symbols to delimit a nonterminal symbol that is specified in the second-level grammar;

`-- --`
Used as a pair of symbols to delimit a comment string;

`{ }`
Used as a pair of symbols to delimit a syntactical unit;

`[ ]`
Used as a pair of symbols to delimit an optional syntactical unit;

`...`
Used following a syntactical unit to indicate that the syntactical unit may be repeated;

`" "`
Used as a pair of symbols to delimit a terminal symbol;

`+`
Used to indicate a string concatenation

First level Grammar

`<attribute-specification> ::= <attribute-name>[**] ( <conditional-value> | <attribute-value-range> )`

`<attribute-name> ::= -- An attribute name from ISO 8613--`
<conditional-value> ::= CASE {<boolean expression>"("<simple-value>")"}...

<boolean-expression> ::= [<name><rel-op>] <atomic-value>

<attribute-value-range> ::= <composite-value> | <simple-value>

<composite-value> ::= <single-range> | <set-range> | <seq-range>

<single-range> ::= "#" <parameter-name> <attribute-value-range>

<parameter-name> ::= —A parameter or sub-parameter name from ISO 8613—

<set-range> ::= "{" <simple-value> [ ",", <simple-value>]..."}"

<seq-range> ::= "{" <simple-value>..."}"

<simple-value> ::= <constraint> | <keyword> | <atomic-value> | <expr-value>

<constraint> ::= <binding-constraint> | <constr-expr-constraint> | <content-gen-constraint> | <reference-constraint>

<binding-constraint> ::= "INITIALIZATION" "(" {<binding-name>}... ")" | "MANIPULATION" "(" {<binding-name>}... ")"

<constr-expr-constraint> ::= <opl> "(" <constr-expr-constraint> ")" | <opN> "(" <construction-list> ")" | <DAP-constituent>

<opl> ::= <iter> | <poss> | <opt> | <rep> | <optrep>

<opN> ::= <ser> | <any> | <set> | <cho> | <seq> | <agg>

<construction-list> ::= <constr-expr-constraint> | <constr-expr-constraint> "," <construction-list>
<reference-constraint> ::= --string literal--

<keyword> ::= "AS_8613" | "NONE" | "N/A"

<DAP-constituent> ::= <DAP-constituent-name>

<DAP-constituent-name> ::= Logdoc, Passage, NumberedSegment, Number, Title, Paragraph, FNote, FNBody, Figure, Text, Reference, Ref, Raster, Geometric,Hdr-Or-Ftr-Content, PageNumber, Laydoc, Pageset, Page, RPage, VPage, Header, Footer, BodyArea, FrameA, FrameB, FrameC, FrameD, FrameE, FrameF, FrameG, FrameH, FrameI, FrameJ, FrameK, Block

<variable> ::= -- string literal that distinguishes a particular instantiation of the DAP constituent.--

<expr-value> ::= <function-value> | <expr>

<function-value> ::= {"OBJECT-CLASS-ID-OF" "{<DAP-constituent> [""|""<DAP-constituent>...]"}"} | "{OBJECT-ID-OF" "{<DAP-constituent> [""|""<DAP-constituent>...]"}"}

<expr> ::= <simple-expr>|<expr><rel-op><simple-expr>

"SIZE"<rel-op><simple-expr>

<simple-expr> ::= <term>|<simple-expr><add-op><term>

<term> ::= <atomic-value>|<term><mult-op><atomic-value>

<atomic-value> ::= --Any attribute value specified in ISO 8613 Part 2, 4, 6, 7 or 8--

<rel-op> ::= "/=" | "/<" | "/." | "/<" | "/=" | "/="

/add-op> ::= "/+" | "/-

<mult-op> ::= "/*" | "//

<name> ::= [{<DAP-constituent>"#"}]<attribute-name> ["#"<parameter-name>]...
Keywords

**
Used to denote that if this attribute is specified for a constituent in the generic structure then the corresponding attribute in the specific structure may not be specified. Note that the use of facility is currently under study.

AS_8613
Used to denote that any value may be specified that is permitted in ISO 8613.

NONE
Used to indicate that there are no valid values for this attribute or parameter.

N/A
Used to denote that there is no applicable attribute value

OBJECT_CLASS_ID_OF
Used to specify any object call identifier from the set of instances of a particular constituent constraint.

OBJECT_ID_OF
Used to specify any object identifier from the set of instances of a particular constituent constraint.

STYLE_OF
Used to specify any style identifier from the set of instances of a particular style constraint.

INITIALIZATION
Constrains bindings that identify which binding name value pairs can be initialized for a particular constituent constraint. Note that a table is provided in the second level grammar that defines the allowed initialization for all instances of bindings.

MANIPULATION
Used to identify a binding that provides an expression value. A BNF specification is provided in the second level grammar that defines the allowed expressions for all instances of bindings.

Delimiters

{...} Used to delimit a syntactical unit.

[...]. Used to delimit optional units.

(....) Used as a general delimiter.

<...> Used to delimit a non-terminal symbol.

/...*/ Used to delimit a comment.

Separators

, : Used to separate set elements.

| : Used to separate alternatives.
.. : Used to specify a range of integers or characters.
# : Used to announce a parameter and attribute value range.
. : Used to distinguish instances of object classes or objects.

Relational operators
= : equality.
> : greater than.
< : less than.
>= : greater than or equal to.
<= : less than or equal to.
<> : not equal.
== : equivalent to.

Arithmetic Operators
+ : addition.
- : subtraction.
* : multiplication.
/ : division.

Second-level Grammar

-- The valid construction expressions for an object class (i.e. the allowable values for the attribute "generator for subordinates") are specified using a meta-construction defined in the first-level grammar. The semantics of a meta-construction are defined such that the result of its evaluation is a construction expression. The result of evaluating a <DAP-constituent> is the identifier of an object class derived from the named constituent constraint. The terminals comprising <opl> and <opN> are called construction operators and are defined in the following second-level grammar. --

-- The operator opt evaluates to a construction expression composed of an optional construction factor specifying an object class identifier or construction expression which is derived from the specified construction expression constraint. --

<<opt>> -> "OPT" (-->object class identifier-- | <--contained expression--)

-- The operator rep evaluates to a construction expression composed of an repetitive construction factor specifying an object class identifier or construction expression which is derived from the specified construction expression constraint. --

<<rep>> -> "REP" (-->object class identifier-- | <--contained expression--)

-- The operator optrep evaluates to a construction expression composed of an optional repetitive construction factor specifying an object class
identifier or construction expression which is derived from the specified construction expression constraint. --

<<optrep>> -> "OPTREP" (—object class identifier— | —contained expression—)

— The operator cho evaluates to a construction expression composed of an choice construction factor specifying an object class identifier or construction expression which is derived from the specified construction expression constraint. --

<<cho>> -> "CHO" (—object class identifier— | —contained expression—)

— The operator seq evaluates to a construction expression composed of an sequence construction factor specifying an object class identifier or construction expression which is derived from the specified construction expression constraint. --

<<seq>> -> "SEQ" (—object class identifier— | —contained expression—)

— The operator agg evaluates to a construction expression composed of an aggregate construction factor specifying an object class identifier or construction expression which is derived from the specified construction expression constraint. --

<<agg>> -> "AGG" (—object class identifier— | —contained expression—)

— The operator iter evaluates to either no construction expression or a construction expression which evaluates to a sequence of objects belonging to object classes derived from the specified construction expression constraint. The object classes need be neither identical nor distinct. --

<<iter>> ::= <null-constr-expr> | <iter-constr-expr>

<null-constr-expr> -> —null construction expression—

<iter-constr-expr> -> <constr-term> | "SEQ" <term-sequence> | "AGG" <term-sequence> | "CHO" <term-sequence>

<!--term-sequence--> ::= <constr-term> | <constr-term> <term-sequence>

<!--constr-term--> ::= <constr-factor> | "OPT" <constr-factor> | "REP" <constr-factor>
The operator \texttt{any} evaluates to either no construction expression or a construction expression which evaluates to an object belonging to an object class identified in the corresponding position in the construction list.

\texttt{any} ::=

- \texttt{null-constr-expr} \\
- \texttt{<term-sequence> CHO <term-sequence> SEQ <constr-term>} \\
- \texttt{<constr-term> \texttt{any-constr-expr} \texttt{any-constr-expr} \texttt{any-constr-expr}}
object class derived from any one of the specified construction expression constraints. —

\[
\langle\text{any}\rangle \ ::= \ \langle\text{null-constr-expr}\rangle \mid \langle\text{any-constr-expr}\rangle
\]

\[
\langle\text{null-constr-expr}\rangle \ ⇝ \ \langle\text{null construction expression}\rangle
\]

\[
\langle\text{any-constr-expr}\rangle \ ::= \ \langle\text{constr-term}\rangle \mid
\]

\[
"\text{CH}\rangle \ \langle\text{term-sequence}\rangle
\]

\[
\langle\text{term-sequence}\rangle \ ::= \ \langle\text{constr-term}\rangle \mid
\]

\[
\langle\text{constr-term}\rangle \ ::= \ \langle\text{constr-factor}\rangle
\]

\[
\langle\text{constr-factor}\rangle \ ::= \ \langle\text{object class identifier}\rangle \mid
\]

\[
\langle\text{contained expression}\rangle
\]

— The operator set evaluates to either no construction expression or a construction expression which evaluates to a sequence of objects; one instance of each belonging to an object class derived from a distinct construction expression constraint within the specified list, in any order. —

\[
\langle\text{set}\rangle \ ::= \ \langle\text{null-constr-expr}\rangle \mid \langle\text{set-constr-expr}\rangle
\]

\[
\langle\text{null-constr-expr}\rangle \ ::= \ \langle\text{null construction expression}\rangle
\]

\[
\langle\text{set-constr-expr}\rangle \ ::= \ \langle\text{constr-term}\rangle \mid
\]

\[
"\text{SEQ}" \ \langle\text{term-sequence}\rangle \mid
\]

\[
"\text{AGG}" \ \langle\text{term-sequence}\rangle \mid
\]

\[
"\text{CH}\rangle \ \langle\text{term-sequence}\rangle
\]

\[
\langle\text{term-sequence}\rangle \ ::= \ \langle\text{constr-term}\rangle \mid
\]

\[
\langle\text{constr-term}\rangle \ ::= \ \langle\text{constr-factor}\rangle
\]

\[
\langle\text{constr-factor}\rangle \ ::= \ \langle\text{object class identifier}\rangle \mid
\]

\[
\langle\text{contained expression}\rangle
\]

— This document application profile permits bindings to be used for automatic numbering schemes, e.g., page numbers and section numbers. This production describes the conventions to be used. The constituent constraints identify bindings by names which describe the use of each binding. Any number of bindings may be used corresponding to each name. —

\[
\langle\text{binding name}\rangle \ ::= \ \langle\text{numbers}\rangle \mid \"\text{PGnum}\rangle \mid
\]

\[
\langle\text{numberstrings}\rangle \mid \langle\text{prefixes}\rangle \mid
\]

\[
\langle\text{suffices}\rangle \mid \langle\text{separators}\rangle
\]

2-30
<numbers> ::= "number-" + <n>
<numberstrings> ::= "numberstring-" + <n>
<prefixes> ::= "prefix-" + <n>
<suffixes> ::= "suffix-" + <n>
<separators> ::= "separator-" + <n>
<n> ::= —any character string from the set of characters: "0".."9"—

-- A numberstring binding can be initialized in an object superior to the relevant numbering scheme (e.g., a passage can initialize a numbering scheme for subordinate sections). A number binding can be initialized at each hierarchical level (e.g., section) to start the numbering sequence for subordinates. The prefix, separator and suffix bindings can be initialized at a level above the numbering scheme and can be re-specified at any level within the numbering scheme.

<table>
<thead>
<tr>
<th>Binding Names</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>number-n</td>
<td>any non-negative number</td>
</tr>
<tr>
<td>FGnum</td>
<td>any non-negative number</td>
</tr>
<tr>
<td>numberstring-n</td>
<td>space character</td>
</tr>
<tr>
<td>prefix-n</td>
<td>string literal</td>
</tr>
<tr>
<td>suffix-n</td>
<td>string literal</td>
</tr>
<tr>
<td>separator-n</td>
<td>string literal</td>
</tr>
</tbody>
</table>

The binding "numberstring" of the numbered object can be used to construct the character string representation of the number. If the numbered objects are all of the same object class, the ORDINAL() numeric function application can be used to create the sequence. If the numbered objects are of different object classes, sequences are generated by incrementing the value of another binding called number-n.--

<number-n> ::= INC(B_REF(PREC(CURR_OBJ))(number-n))

-- The "numberstring" binding is referenced by a content generator in a subordinate of the numbered object.--

<numberstring-n> ::= <hierarchic exprm> | <simple exprm>
<hierarchic exprm> ::= B_REF(SUP_OBJ(CURR_OBJ))(numberstring-n)
+ B_REF(SUP_OBJ(CURR_OBJ))
  (separator-n) + <simple exprm>
<simple exprm> ::= <string function>
  (B_REF(CURR_OBJ)(number-n))
  | <string function> (ORD(CURR_OBJ))
There are four possible ways of determining the value for the attribute "content generator," as follows:

<content-gen-constraint> ::= <content-generator-1> | <content-generator-2> | <content-generator-3> | <content-generator-4>

<content-generator-1> ::= <num stl> | <pre stl> + <num stl> | <num stl> + <suf stl> | <pre stl> + <num stl> + <suf stl>

<num stl> ::= B_REF(SUP_OBJ(CURR_OBJ))
           (numberstring-n)
<pre stl> ::= B_REF(SUP_OBJ(CURR_OBJ))(prefix-n)
           | <string literal>
<suf stl> ::= B_REF(SUP_OBJ(CURR_OBJ))(suffix-n)
           | <string literal>

<content-generator-2> ::= <pgnum st2> | <pgpre st2> + <pgnum st2> | <pgnum st2> + <pgsuf st2> | <pgnum st2> + <pgpre st2> + <pgsuf st2>

<pgpre st2> ::= <string literal>
<pgsuf st2> ::= <string literal>
<pgnum st2> ::= MK_STR (<numeric expression2>)
       | U_ALPHA (<numeric expression2>)
       | L_ALPHA (<numeric expression2>)
       | U_ROM (<numeric expression2>)
       | L_ROM (<numeric expression2>)
<numeric expression2> ::= B_REF(SUP(CURR_INST(<class or type>,CURR_OBJ)))(number)
<class or type> ::= frame | page |
                   OBJECT_ID_OF((FrameA | FrameB | FrameC | FrameD | FrameE | FrameF | FrameG | FrameH | FrameI | FrameJ | FrameK | Page | RPage | VPage))
MK_STR (<numeric expression3>)
| U_ALPHA (<numeric expression3>)
| L_ALPHA (<numeric expression3>)
| U_ROM (<numeric expression3>)
| L_ROM (<numeric expression3>)

<numeric expression3> ::= B_REF(SUP(CURR_INST(frame, CURR_OBJ))(PGnum))

<content-generator-4> ::= | <num st4> + | <num st4> + <suf st4> + <num st4> + <suf st4> + <suf st4>
<num st4> ::= B_REF(<any-object>)
(numberstring-n)
<pre st4> ::= B_REF(<any-object>) (prefix-n) | <string literal>
<suf st4> ::= B_REF(<any-object>) (suffix-n) | <string literal>
<any-object> ::= OBJECT_IF_OD((Logdoc | Passage | NumberedSegment | Number | Title | Paragraph | FNote | FBody | Figure | Text | Reference | Ref | Raster | Geometric | Hdr-Or-Ftr-Content | PageNumber | Laydoc | Pageset | Page | RPage | VPage | Header | Footer | BodyArea | FrameA | FrameB | FrameC | FrameD | FrameE | FrameF | FrameG | FrameH | FrameI | FrameJ | FrameK | Block))
Diagram of Logical Structure (1 of 2)
Diagram of Logical Structure (2 of 2)
2.2.3 LOGICAL STRUCTURE

Logdoc

REQUIRED

--Generic--

Object-Type (document-logical-root)
Object-Class-Identifier (?AS_8613
Generator-For-Subordinates {ser(pos(Title),
any(iter(any(Paragraph,
Figure,NumberedSegment,
Text,Raster,Geometric)),
iter(any(Paragraph,Figure,
Passage,Text,Raster,
Geometric)))))

Application-Comments
("Logdoc")

--Specific--

Object-Identifier (?AS_8613
Object-Class (OBJECT_CLASS_ID_OF(Logdoc))
Subordinates (?AS_8613

PERMITTED

--Generic--

Layout-Style (STYLE_OF(L-style1))
Resource (?AS_8613
User-Readable-Comments (?AS_8613
User-Visible-Name (?AS_8613
Bindings (INITIALIZATION(number,
numberstring,prefix,
suffix,separator))

Default-Value-Lists (?AS_8613
Protection (?AS_8613

--Specific--

Layout-Style (STYLE_OF(L-style1))
User-Readable-Comments (?AS_8613
User-Visible-Name (?AS_8613
Bindings (INITIALIZATION(number,
numberstring,prefix,
suffix,separator))

Default-Value-Lists (?AS_8613
Protection (?AS_8613
Application-Comments ("Logdoc")

2-36
Passage

REQUIRED

--Generic--

Object-Type (composite-logical-object)
Object-Class-Identifier (AS_8613)
Generator-For-Subordinates

Geometric)

Application-Comments ("Passage")

--Specific--

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF(Passage))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (INITIALIZATION(number, numberstring, prefix, suffix, separator))

Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style3))

--Specific--

User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (INITIALIZATION(number, numberstring, prefix, suffix, separator))

Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style3))
Application-Comments ("Passage")
NumberedSegment

REQUIRED

--Generic--

Object-Type
Object-Class-Identifier (composite-logical-object)
Generator-For-Subordinates (AS_8613)

Bindings
Application-Comments

--Specific--

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF
Subordinates (NumberedSegment))

PERMITTED

--Generic--

Resource
User-Readable-Comments
User-Visible-Name
Bindings

Protection
Layout-Style

--Specific--

User-Readable-Comments
User-Visible-Name
Bindings

Protection
Layout-Style
Application-Comments

2-38
Number

REQUIRED

--Generic--

Object-Type (basic-logical-object)
Object-Class-Identifier (AS_8613)
Content-Generator (<content-generator-1>)
Application-Comments ("Number")

--Specific--

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF(Number))

PERMITTED

--Generic--

Resource (AS_8613)
Presentation-Style (STYLE_OF(P-Style1))
Content-Architecture-Class (P-Style1)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style4))

--Specific--

Presentation-Style (STYLE_OF(P-Style1))
Content-Architecture-Class (P-Style1)
User-Readable-Comments (<content-generator-1>)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style4))
Application-Comments ("Number")

2-39
Title

REQUIRED

--Generic--

Object-Type {composite-logical-object}
Object-Class-Identifier {AS_8613}
Generator-for-Subordinates {Paragraph}
Application-Comments {"Title"}

--Specific--

Object-Identifier {AS_8613}
Object-Class {OBJECT_CLASS_ID_OF(Title)}
Subordinates {AS_8613}

PERMITTED

--Generic--

Resource {AS_8613}
User-Readable-Comments {AS_8613}
User-Visible-Name {AS_8613}
Protection {AS_8613}
Layout-Style {STYLE_OF(L-Style3)}

--Specific--

User-Readable-Comments {AS_8613}
User-Visible-Name {AS_8613}
Protection {AS_8613}
Layout-Style {STYLE_OF(L-Style3)}
Application-Comments {"Title"}
REQUIRED

--Generic--

Object-Type: (composite-logical-object)
Object-Class-Identifier: (AS_8613)
Generator-for-Subordinates: (iter(any(Text, FNote, Reference, Figure, Raster, Geometric)))
Application-Comments: ("Paragraph")

--Specific--

Object-Identifier: (AS_8613)
Object-Class: (OBJECT_CLASS_ID_OF (Paragraph))
Subordinates: (AS_8613)

PERMITTED

--Generic--

Resource: (AS_8613)
User-Readable-Comments: (AS_8613)
User-Visible-Name: (AS_8613)
Protection: (AS_8613)
Layout-Style: (STYLE_OF(L-Style3))

--Specific--

User-Readable-Comments: (AS_8613)
User-Visible-Name: (AS_8613)
Protection: (AS_8613)
Layout-Style: (STYLE_OF(L-Style3))
Application-Comments: ("Paragraph")
**FNNote**

**REQUIRED**

---Generic---

Object-Type {composite-logical-object}
Object-Class-Identifier {AS_8613}
Generator-for-Subordinates {ser(Number, FNBody)}
Application-Comments {"FNNote"}

---Specific---

Object-Identifier {AS_8613}
Object-Class {OBJECT_CLASS_ID_OF(FNNote)}
Subordinates {AS_8613}

**PERMITTED**

---Generic---

Resource {AS_8613}
User-Readable-Comments {AS_8613}
User-Visible-Name {AS_8613}
Bindings (INITIALIZATION(numberstring, number)
MANIPULATION(numberstring, number))
Protection {AS_8613}
Layout-Style {STYLE_OF(L-Style3)}

---Specific---

User-Readable-Comments {AS_8613}
User-Visible-Name {AS_8613}
Bindings (INITIALIZATION(numberstring, number)
MANIPULATION(numberstring, number))
Protection {AS_8613}
Layout-Style {STYLE_OF(L-Style3)}
Application-Comments {"FNNote"}
**FNBody**

**REQUIRED**

---Generic---

Object-Type
Object-Class-Identifier
Generator-for-Subordinates
Layout-Style
Application-Comments

---Specific---

Object-Identifier
Object-Class
Subordinates

**PERMITTED**

---Generic---

Resource
User-Readable-Comments
User-Visible-Name
Protection

---Specific---

Layout-Style
User-Readable-Comments
User-Visible-Name
Protection
Application-Comments

{composite-logical-object}
{AS_8613}
{ser(Number,(iter(Text)))}
{STYLE_OF(L-Style3)}
{"FNBody"}

{AS_8613}

{OBJECT_CLASS_ID_OF(FNBody)}

{AS_8613}

{AS_8613}

{STYLE_OF(L-Style3)}

{AS_8613}

{AS_8613}

{AS_8613}

{"FNBody"}
Figure

REQUIRED

--Generic--

Object-Type
Object-Class-Identifier
Generator-for-Subordinate
Application-Comments

(composite-logical-object)
(AS_8613)
(ser(poss(Number),poss(Title),
iter(any(Paragraph,Text,
Raster,Geometric))))
("Figure")

--Specific--

Object-Identifier
Object-Class
Subordinates

(AS_8613)
(OBJECT_CLASS_ID_OF(Figure))
(AS_8613)

PERMITTED

--Generic--

Resource
User-Readable-Comments
User-Visible-Name
Bindings
Protection
Layout-Style

(AS_8613)
(AS_8613)
(AS_8613)
(MANIPULATION(number,
numberstring))
(AS_8613)
(STYLE_OF(L-Style3))

--Specific--

User-Readable-Comments
User-Visible-Name
Bindings
Protection
Layout-Style
Application-Comments

(AS_8613)
(AS_8613)
(MANIPULATION(number,
numberstring))
(AS_8613)
(STYLE_OF(L-Style3))
("Figure")
### REQUIRED

---Generic---

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(basic-logical-object)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class-Identifier</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>('&quot;Text&quot;')</td>
</tr>
</tbody>
</table>

---Specific---

<table>
<thead>
<tr>
<th>Object-Identifier</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class</td>
<td>(OBJECT_CLASS_ID_OF(Text))</td>
</tr>
</tbody>
</table>

### PERMITTED

---Generic---

<table>
<thead>
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<th>Resource</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Presentation-Style</td>
<td>(STYLE_OF(P-Style2))</td>
</tr>
<tr>
<td>Content-Architecture-Class</td>
<td>CASE</td>
</tr>
<tr>
<td></td>
<td>cf (2 8 2 6 0)</td>
</tr>
<tr>
<td></td>
<td>cp (2 8 2 6 1)</td>
</tr>
<tr>
<td></td>
<td>cfp (2 8 2 6 2)</td>
</tr>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Protection</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Style</td>
<td>(STYLE_OF(L-Style5))</td>
</tr>
<tr>
<td>Content-Portions</td>
<td>(AS_8613)</td>
</tr>
</tbody>
</table>

---Specific---

| Presentation-Style | (STYLE_OF(P-Style2)) |
| Content-Architecture-Class | CASE |
|                   | cf (2 8 2 6 0) |
|                   | cp (2 8 2 6 1) |
|                   | cfp (2 8 2 6 2) |
| User-Readable-Comments | (AS_8613) |
| User-Visible-Name  | (AS_8613) |
| Protection         | (AS_8613) |
| Layout-Style       | (STYLE_OF(L-Style5)) |
| Content-Portions   | (AS_8613) |
| Application-Comments | ('"Text"') |

2-45
Reference

REQUIRED

--Generic--

Object-Type (composite-logical-object)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (ser(poss(Text),Ref,
poss(Text)))
Application-Comments ("Reference")

--Specific--

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF
(Reference))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (MANIPULATION(numberstring,
number))
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style3))

--Specific--

User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (MANIPULATION(numberstring,
number))
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style3))
Application-Comments ("Reference")

2-46
Ref

REQUIRED

---Generic---

Object-Type (basic-logical-object)
Object-Class-Identifier (AS_8613)
Application-Comments ("Ref")

---Specific---

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF(Ref))

PERMITTED

---Generic---

Content-Generator (<content-generator-4>)
Content-Portions (AS_8613)
Resource (AS_8613)
Presentation-Style (STYLE_OF(P-Style2))
Content-Architecture-Class CASE
    cp (2 8 2 6 1)
    cfp (2 8 2 6 2)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style5))

---Specific---

Content-Generator (<content-generator-4>)
Content-Portions (AS_8613)
Presentation-Style (STYLE_OF(P-Style2))
Content-Architecture-Class CASE
    cp (2 8 2 6 1)
    cfp (2 8 2 6 2)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style5))
Application-Comments ("Ref")
REQUIRED

--Generic--

Object-Type (basic-logical-object)
Object-Class-Identifier (AS_8613)
Application-Comments ("Raster")

--Specific--

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF(Raster))

PERMITTED

--Generic--

Content-Portions (AS_8613)
Content-Architecture-Class (2 8 2 7 2) /* rfp */
Resource (AS_8613)
Presentation-Style (STYLE_OF(P-Style3))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style6))

--Specific--

Content-Portions (AS_8613)
Content-Architecture-Class (2 8 2 7 2) /* rfp */
Presentation-Style (STYLE_OF(P-Style3))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style6))
Application-Comments ("Raster")
**Geometric**

**REQUIRED**

---Generic---

Object-Type (basic-logical-object)
Object-Class-Identifier (AS_8613)
Application-Comments ("Geometric")

---Specific---

Object-Identifier (AS_8613)
Object-Class (OBJECT_CLASS_ID_OF (Geometric))

**PERMITTED**

---Generic---

Content-Portions (AS_8613)
Content-Architecture-Class (2 8 2 8 0) /* gfp */
Resource (AS_8613)
Presentation-Style (STYLE_OF(P-Style4))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style6))

---Specific---

Content-Portions (AS_8613)
Content-Architecture-Class (2 8 2 8 0) /* gfp */
Presentation-Style (STYLE_OF(P-Style4))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Protection (AS_8613)
Layout-Style (STYLE_OF(L-Style6))
Application-Comments ("Geometric")
Hdr-Or-Ftr-Content

REQUIRED

--Generic--

Object-Type (composite-logical-object)
Object-Class-Identifier \{AS_8613\}
Generator-for-Subordinates (iter(any(Raster,Geometric,
                              Text,PageNumber)))
Application-Comments ("Hdr-or-Ftr-Content")

PERMITTED

--Generic--

Resource \{AS_8613\}
User-Readable-Comments \{AS_8613\}
User-Visible-Name \{AS_8613\}
Protection \{AS_8613\}

2-50
<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>(AS_8613)</td>
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<td>Content-Generator</td>
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</tr>
<tr>
<td>Application-Comments</td>
<td>(&quot;PageNumber&quot;)</td>
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<table>
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<td>Presentation-Style</td>
<td>(STYLE_OF(P-Style2))</td>
</tr>
<tr>
<td>Content-Architecture-Class</td>
<td>(2 8 2 6 1) /* cp */</td>
</tr>
<tr>
<td>User-Readable-Comments</td>
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<tr>
<td>Protection</td>
<td>(AS_8613)</td>
</tr>
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L-Style1

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<td>(AS_8613)</td>
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</table>

<table>
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</tr>
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<tbody>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
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<td>(AS_8613)</td>
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L-Style2

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</tbody>
</table>

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Block-Alignment</td>
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</tr>
<tr>
<td>Concatenation</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Indivisibility</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Category</td>
<td>(AS_8613)</td>
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<td>Layout-Object-Class</td>
<td>(AS_8613)</td>
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<td>New-Layout-Object</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Same-Layout-Object</td>
<td>(AS_8613)</td>
</tr>
</tbody>
</table>

2-51
Offset (AS_8613)
Separation (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

L-Style3

REQUIRED

Layout-Style-Identifier (AS_8613)

PERMITTED

Indivisibility (AS_8613)
Layout-Object-Class (AS_8613)
New-Layout-Object (AS_8613)
Same-Layout-Object (AS_8613)
Synchronisation (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

L-Style4

REQUIRED

Layout-Style-Identifier (AS_8613)

PERMITTED

Block-Alignment (AS_8613)
Concatenation (AS_8613)
Indivisibility (AS_8613)
Layout-Category (AS_8613)
Layout-Object-Class (AS_8613)
New-Layout-Object (AS_8613)
Offset (AS_8613)
Same-Layout-Object (AS_8613)
Separation (AS_8613)
Synchronisation (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

L-Style5

REQUIRED

Layout-Style-Identifier (AS_8613)

PERMITTED

2-52
Block-Alignment (AS_8613)
Concatenation (AS_8613)
Fill-Order (AS_8613)
Indivisibility (AS_8613)
Layout-Category (AS_8613)
Layout-Object-Class (AS_8613)
New-Layout-Object (AS_8613)
Offset (AS_8613)
Same-Layout-Object (AS_8613)
Separation (AS_8613)
Synchronisation (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

L-Style6

REQUIRED

Layout-Style-Identifier (AS_8613)

PERMITTED

Block-Alignment (AS_8613)
Indivisibility (AS_8613)
Layout-Category (AS_8613)
Layout-Object-Class (AS_8613)
New-Layout-Object (AS_8613)
Offset (AS_8613)
Same-Layout-Object (AS_8613)
Separation (AS_8613)
Synchronisation (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

P-Style1

REQUIRED

Presentation-Style-Identifier (AS_8613)

PERMITTED

Border (AS_8613)
Character-Presentation-Attributes /* see section on character content */
Colour (AS_8613)
Transparency (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

2-53
P-Style2

REQUIRED

Presentation-Style-Identifier (AS_8613)
Content-Architecture-Class CASE
   cp (2 8 2 6 1)
   cfp (2 8 2 6 2)

PERMITTED

Border (AS_8613)
Character-Presentation-Attributes /* see section on character content */
Colour (AS_8613)
Transparency (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

P-Style3

REQUIRED

Presentation-Style-Identifier (AS_8613)
Content-Architecture-Class (2 8 2 7 2) /* rfp */

PERMITTED

Border (AS_8613)
Colour (AS_8613)
Raster-Graphic-Presentation-Attributes /* see section on raster graphics content */
Transparency (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

P-Style4

REQUIRED

Presentation-Style-Identifier (AS_8613)
Content-Architecture-Class (2 8 2 7 2) /* gfp */

PERMITTED

Border (AS_8613)
Colour (AS_8613)
Geometric-Graphic-Presentation-Attributes /* see section on geometric content */
2-54
Diagram of Layout Structure (1 of 2)
Diagram of Layout Structure (2 of 2)
2.2.4 LAYOUT STRUCTURE

Laydoc

REQUIRED

---Generic---

Object-Type (document-layout-root)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (iter(pageset))
Application-Comments ("Laydoc")

---Specific---

Object-Identifier (AS_8613)
Object-Class CASE
  fda {N/A}
  fpda {OBJECT_CLASS_ID_OF(Laydoc)}
Subordinates (AS_8613)

PERMITTED

---Generic---

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Default-Value-Lists (AS_8613)
Bindings {Initialization (PGnum)}

---Specific---

Object-Type (document-layout-root)
Object-Class CASE
  fda {OBJECT_CLASS_ID_OF(Laydoc)}
  fpda {N/A}
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Default-Value-Lists (AS_8613)
Bindings {Initialization (PGnum)}
Application-Comments ("Laydoc")
In the expression for "Generator for Subordinates" in this object, there are two instances each of the objects 'Rpage.x' and 'Vpage.y'. The dot notation is used to show that both occurrences of Rpage.x are objects of the type 'Rpage', and if they are used in a generic structure, they must both refer to the same single occurrence of an 'Rpage' object class.

REQUIRED

--Generic--

Object-Type (pageset)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (ser(poss(Page), any(rep(Page),
seq(poss(Rpage.x),
poss(rep(seq(Vpage.y,
Rpage.x)),
poss(Vpage.y)))

Application-Comments ("PageSet")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE
   fda (N/A)
   fpda (OBJECT_CLASS_ID_OF(PageSet))

Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (Initialization (PGnum))

--Specific--

Object-Type (pageset)
Object-Class CASE
   fda (OBJECT_CLASS_ID_OF(PageSet))
   fpda (N/A)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Bindings (Initialization (PGnum))
Application-Comments ("PageSet")

2-58
REQUIRED

--Generic--

Object-Type (page)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (set(any(opt(\text{Frame J, poss \{Header\}}),
any(\text{Frame K, poss \{BodyArea\}},
any(opt(\text{Frame J, poss \{Footer\}}))))

Application-Comments ("Page")

--Specific--

Object-Identifier (AS_8613)
Object-Class \text{CASE}
\begin{align*}
\text{fda} & \quad \text{(N/A)} \\
\text{fpda} & \quad \{\text{OBJECT\_CLASS\_ID\_OF(Page)}\}
\end{align*}

Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
Dimensions /*Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations */
Medium-Type /*Nominal Page Size(ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*)*/
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Page-Position (AS_8613)
Bindings (MANIPULATION (PGnum))

--Specific--

Object-Type (page)
Object-Class \text{CASE}
\begin{align*}
\text{fda} & \quad \{\text{OBJECT\_CLASS\_ID\_OF(Page)}\} \\
\text{fpda} & \quad \text{(N/A)}
\end{align*}

2-59
### Dimensions

/* Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations */

### Medium-Type

/* Nominal Page Size (ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations */

### User-Readable-Comments

(#Side Of Sheet ('unspecified'))

### User-Visible-Name

(AS_8613)

### Transparency

(AS_8613)

### Page-Position

(AS_8613)

### Colour

(AS_8613)

### Bindings

{MANIPULATION (PGnum)}

### Application-Comments

("Page")

---

**RELATIONS**

```plaintext
Dimensions = SIBLING(Vpage(#dimensions));
Dimensions = SIBLING(Rpage(#dimensions));
```

**Note:** the relations formulae are used to satisfy the constraint that all pages within an instance of a Pageset must have the same dimensions. Relations apply to both generic and specific structures.

**Note:** Dimensions for ISO A4, ISO A3, and NAL; nominal page size and assured reproduction area are as defined in ISO 8613-2.

For North American Legal the dimensions are:

- **nominal page:** 10200 x 16800
- **assured reproduction area:** 9500 x 16000
REQUIRED

--Generic--

Object-Type
Object-Class-Identifier
Generator-for-Subordinates
Medium-Type
Application-Comments

--Specific--

Object-Identifier
Object-Class
Subordinates

PERMITTED

--Generic--

Resource
Dimensions

Bindings
User-Readable-Comments
User-Visible-Name
Transparency
Page-Position
Colour

--Specific--

Object-Type
Object-Class
Dimensions

/*Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

"Rpage"

/*Nominal Page Size(ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

#{Side Of Sheet('recto')}

/*Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

(MANIPULATION (PGnum))

*/
North American Legal, for each with both portrait and landscape orientations*/

/*Nominal Page Size(ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/
(#Side Of Sheet('recto'))

{MANIPULATION (PGnum)}

{AS_8613}

{AS_8613}

{AS_8613}

{AS_8613}

"Rpage"

RELATIONS

Dimensions == SIBLING(Vpage(#dimensions));
Dimensions == SIBLING(Page(#dimensions));

Note: Dimensions for ISO A4, ISO A3, and NAL, nominal page size and assured reproduction area are as defined in ISO 8613-2.

For North American Legal the dimensions are:

nominal page: 10200 x 16800
assured reproduction area: 9500 x 16000
REQUIRED

--Generic--

Object-Type (page)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates
(set(any(opt(Frame J, poss(Header)), any(Frame K, poss(BodyArea)), any(opt(Frame J, poss(Footer))))

Medium-Type /*Nominal Page Size(ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/
#Side Of Sheet('verso'))

Application-Comments ("Vpage")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE
  fda (N/A)
  fpda (OBJECT_CLASS_ID_OF(VPage))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
Dimensions /*Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

Bindings (MANIPULATION(PGnum))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Page-Position (AS_8613)
Colour (AS_8613)

--Specific--

Object-Type (page)
Object-Class CASE
  fda (OBJECT_CLASS_ID_OF(VPage))
  fpda (N/A)
Dimensions /*Assured reproduction areas for ISO-A4, ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

2-63
American Legal, for each with both portrait and landscape orientations*/

/*Nominal Page Size(ISO-A4,ISO-A3, NAL, North American Legal, for each with both portrait and landscape orientations*/

(#Side Of Sheet('verso'))

(MANIPULATION(PGnum))

RELATIONS

Dimensions = SIBLING(Page(#dimensions));
Dimensions = SIBLING(Rpage(#dimensions));

Note: Dimensions for ISO A4, ISO A3, and NAL, nominal page size and assured reproduction area are as defined in ISO 8613-2.

For North American Legal the dimensions are:

nominal page: 10200 x 16800
assured reproduction area: 9500 x 16000
REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (iter(any(FrameH,
FrameC,FrameG)))
Position (#fixed(AS_8613))
Dimensions (#horizontal(#fixed(AS_8613)))
(Application-Comments "Header")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE
   fda (N/A)
   fpda (OBJECT_CLASS_ID_OF(Header))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Layout-Path (90, 270)

--Specific--

Object-Type (frame)
Object-Class CASE
   fda (OBJECT_CLASS_ID_OF(Header))
   fpda (N/A)
Position (AS_8613)
Dimensions (#horizontal(#fixed(AS_8613)))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Layout-Path (90, 270)
Imaging-Order (AS_8613)
Application-Comments ("Header")

RELATIONS

\[ \text{Position} \rangle (\text{SIBLING} (\text{BodyArea}(\text{#dimensions} + \text{#position})) \); \\
\text{Position} \rangle (\text{SIBLING} (\text{Footer}(\text{#dimensions} + \text{#position}))) \);

Note: The relations formulae are used to satisfy the constraint that Header frames, Body frames and Footer frames must not overlap. It is also assumed that the bottom of a header frame must be higher up on the page than the top of either a body frame or a footer frame, and that the bottom of a body frame must be higher up on the page than the top of a footer frame.
REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (iter(any(FrameH, FrameC, FrameG)))
Position (#fixed(AS_8613))
Dimensions (AS_8613)
Application-Comments ("Footer")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE
  fda (N/A)
  fpda (OBJECT_CLASS_ID_OF(Footer))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Layout-Path (90,270)

--Specific--

Object-Type (frame)
Object-Class CASE
  fda (OBJECT_CLASS_ID_OF(Footer))
  fpda (N/A)
Position (AS_8613)
Dimensions (#fixed(AS_8613))
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Layout-Path (90,270)
Imaging-Order (AS_8613)
Application-Comments ("Footer")

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BodyArea

REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates (iter(any(FrameB,FrameC,
FrameD,FrameF,
FrameG,FrameH)))

Position

Dimensions

Application-Comments

("BodyArea")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE
tda (N/A)
fnda (OBJECT_CLASS_ID_OF(BodyArea))

Subordinates

PERMITTED

--Generic--

Resource
User-Readable-Comments
User-Visible-Name
Transparency
Colour
Border
Layout-Path (90,270)

--Specific--

Object-Type (frame)
Object-Class CASE
tda (OBJECT_CLASS_ID_OF(BodyArea))
fnda (N/A)

Position

Dimensions

User-Readable-Comments
User-Visible-Name
Transparency
Colour
Border
Layout-Path (90,270)
Imaging-Order (AS_8613)
Application-Comments ("Body Area")
RELATIONS

Position#y > SIBLING(Footer(#dimensions#y + #position#y));
FrameA

FrameA is a region of the page typically representing a column. The direct subordinates are blocks of content. FrameA is at a fixed position within its superior frame. The dimension orthogonal to the layout path is fixed; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinates.

**REQUIRED**

**--Generic--**

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(frame)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class-Identifier</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Position</td>
<td>(#fixed(AS_8613))</td>
</tr>
</tbody>
</table>
| Dimensions      | (#horizontal(fixed,default)
| Application-Comments | ("FrameA") |

**--Specific--**

| Object-Identifier | (AS_8613) |
| Object-Class      | CASE |
|                   | fda   | (N/A) |
|                   | fpda  | {OBJECT_CLASS_ID_OF(FrameA)} |
|                   |       | {OBJECT_ID_OF(Block)} |

**PERMITTED**

**--Generic--**

| Permitted Categories | (AS_8613) |
| Resource            | (AS_8613) |
| User-Readable-Comments | (AS_8613) |
| User-Visible-Name   | (AS_8613) |
| Transparency        | (AS_8613) |
| Colour              | (AS_8613) |
| Border              | (AS_8613) |

**--Specific--**

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(frame)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class-Identifier</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Position</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Permitted Categories</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
</tbody>
</table>

2-70
<table>
<thead>
<tr>
<th>Colour</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>&quot;FrameA&quot;</td>
</tr>
</tbody>
</table>
FrameB is a region of the page, typically representing a number of columns. The direct subordinates may only be frames of type A or I. The position is variable (i.e., determined by a rule). The dimension orthogonal to the layout path is maximum for the position; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinates.

REQUIRED

--Generic--

Object-Type {frame}
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates {iter(cho(FrameA,FrameI))}
Position {#variable(AS_8613)}
Dimensions {#horizontal(fixed (AS_8613), default) #vertical(Rule-B)}

Application-Comments "FrameB"

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE fda (N/A)
fpda (OBJECT_CLASS_ID_OF(FrameB))
Subordinates (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Layout-Path (90,270)
Balance (AS_8613)

--Specific--

Object-Type {frame}
Object-Class CASE
fda (OBJECT_CLASS_ID_OF(FrameB))
fpda (N/A)
Position (AS_8613)
Dimensions (AS_8613)
User-Readable-Comments (AS_8613)
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Path</td>
<td>(90,270)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Balance</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>&quot;FrameB&quot;</td>
</tr>
</tbody>
</table>
FrameC is a region of the page, typically representing an area of variable dimension within a column, such as is needed to contain a paragraph of text or a figure. This provides for varying layout on pages (columns or pages) as the document is edited. The direct subordinates are blocks of content. The position is variable (i.e., determined by a rule). The dimension orthogonal to the layout path is maximum for the position; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinate block(s).

REQUIRED

---Generic---

Object-Type  (frame)
Object-Class-Identifier  (AS_8613)
Position  (#variable(AS_8613))
Dimensions  (#horizontal(fixed (AS_8613),default),
#vertical(Rule-B))
Application-Comments  ("FrameC")

---Specific---

Object-Identifier  (AS_8613)
Object-Class  CASE
  fda  (N/A)
  fpda  {OBJECT_CLASS_ID_OF(FrameC)}
Subordinates  {OBJECT_ID_OF(Block)}

PERMITTED

---Generic---

Resource  (AS_8613)
User-Readable-Comments  (AS_8613)
User-Visible-Name  (AS_8613)
Transparency  (AS_8613)
Colour  (AS_8613)
Border  (AS_8613)
Permitted-Categories  (AS_8613)

---Specific---

Object-Type  (frame)
Object-Class  CASE
  fda  (OBJECT_CLASS_ID_OF(FrameC))
  fpda  (N/A)
Position  (AS_8613)
Dimensions  (#horizontal(default)
<table>
<thead>
<tr>
<th>User-Readable-Comments</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>&quot;FrameC&quot;</td>
</tr>
<tr>
<td>Permitted-Categories</td>
<td>(AS_8613)</td>
</tr>
</tbody>
</table>
FrameD is a region of the page, typically representing an area of variable dimension within a column, containing a number of items side by side (e.g., text flowing around a picture). The direct subordinates may only be frames of type E. The position is variable (i.e., determined by a rule). The dimension orthogonal to the layout path is maximum for the position; in the direction of the layout path, the dimension is the minimum size needed to contain the first laid out subordinate (e.g., the picture).

REQUIRED

---Generic---

Object-Type  (frame)
Object-Class-Identifier (AS_8613)
Generator-for-Subordinates {iter(poss(FrameE))}
Position (#variable(AS_8613))
Dimensions (#horizontal{default}
              #vertical{Rule-A})
Application-Comments ("FrameD")
Layout-Path (0,180)

---Specific---

Object-Identifier (AS_8613)
Object-Class CASE
      fpda  {N/A)
      fpda  {OBJECT_CLASS_ID_OF(FrameD)}
Subordinates (AS_8613)

PERMITTED

---Generic---

Resource (AS_8613)
User Readable Comments (AS_8613)
User Visible Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Bindings {MANIPULATION(PGnum)}

---Specific---

Object-Type  (frame)
Object-Class CASE
      fpda  {OBJECT_CLASS_ID_OF(FrameD)}
      fpda  {N/A)
Position (AS_8613)
Dimensions (#horizontal{default})
<table>
<thead>
<tr>
<th>User Readable Comments</th>
<th>(#vertical(AS_8613))</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Visible Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Imaging Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Bindings</td>
<td>(MANIPULATION(PGnum))</td>
</tr>
<tr>
<td>Application Comments</td>
<td>(&quot;FrameD&quot;)</td>
</tr>
</tbody>
</table>

2-77
FrameE is a region of the page, typically representing some text or a picture, that is side by side with the frames of this type within a superior frame of type D. The direct subordinates are blocks of content. The position is variable (i.e., determined by a rule). The dimension orthogonal to the layout path is the minimum size needed to contain the subordinate block(s). In the direction of the layout path, the dimension is either a fixed dimension or is a computed dimension equal to either the minimum size needed to contain the subordinate block(s) (e.g., picture), or the maximum size for the position (e.g., text).

REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Position (#variable position(AS_8613))
Dimensions (#horizontal(Rule-B, fixed, default), #vertical(Rule-B))
Permitted-Categories (AS_8613)
Application-Comments ("FrameE")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE fda {N/A}
fpda {OBJECT_CLASS_ID_OF(FrameE)}
Subordinates CASE Permitted-Categories (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)

--Specific--

Object-Type (frame)
Object-Class CASE fda (OBJECT_CLASS_ID_OF(FrameE))
fpda {N/A}
Position (AS_8613)
<table>
<thead>
<tr>
<th>Dimensions</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>(&quot;FrameE&quot;)</td>
</tr>
</tbody>
</table>
Frame F is a region of the page typically used to contain a footnote. The direct subordinates are blocks of content. The frame is positioned within its superior in reverse order at a fixed position from its superior in the direction orthogonal to the layout path and at a variable position in the direction of the layout path. The dimension orthogonal to the layout path is maximum for the position; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinate blocks.

REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Position 

#variable(#fill order(reversed)), #offset(AS_8613),
#separation(AS_8613),
#alignment(AS_8613)

#horizontal(default)
#vertical(Rule-B)

Dimensions

Permitted-Categories (AS_8613)
Application-Comments ("FrameF")

--Specific--

Object-Identifier (AS_8613)
Object-Class CASE

fda {N/A}
fpda {OBJECT_CLASS_ID_OF(FrameF)}

Subordinates {OBJECT-OF(Block)}
Permitted-Categories (AS_8613)

PERMITTED

--Generic--

Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)

--Specific--

Object-Type (frame)
Object-Class CASE
<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>fda</td>
<td>(OBJECT_CLASS_ID_OF(FrameF))</td>
</tr>
<tr>
<td>fpda</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Position</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(#horizontal(default)</td>
</tr>
<tr>
<td></td>
<td>#vertical(AS_8613))</td>
</tr>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>('FrameF')</td>
</tr>
</tbody>
</table>
FrameG

FrameG is a region of the page, typically representing a set of pieces of content placed at defined positions. This provides for complex, fixed, relatively positioned pieces of content, including overlapping pieces of content (e.g., overlapping pictures or pictures and text). The direct subordinates are blocks of content. The position relative to the superior is fixed; the dimensions are also fixed.

REQUIRED

---Generic---

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Position (#fixed(AS_8613))
Dimensions (#horizontal(AS_8613) #vertical(AS_8613))
Application-Comments ("FrameG")

---Specific---

Object-Identifier (AS_8613)
Object-Class CASE
fda (N/A)
fpda (OBJECT_CLASS_ID_OF(FrameG))
Subordinates (OBJECT_ID_OF(Block))

PERMITTED

---Generic---

Generator-For-Subordinates {seq(Block)}
Resource (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Permitted-Categories (AS_8613)

---Specific---

Object-Type (frame)
Object-Class CASE
fda (OBJECT_CLASS_ID_OF(FrameG))
fpda (N/A)
Position (AS_8613)
Dimensions (AS_8613)
User-Readable-Comments (AS_8613)
User-Visible-Name (AS_8613)

2-82
Transparency (AS_8613)
Colour (AS_8613)
Border (AS_8613)
Imaging-Order (AS_8613)
Application-Comments ("FrameG")
Permitted-Categories (AS_8613)
FrameH is a region of the page, typically representing a variable piece of logical information in the header or footer area of a page (e.g., current chapter number). The direct subordinates are blocks of content. The frame, in all cases, specifies that its content is derived from the use of the attribute "logical source" referring to a logical object of "header or footer content." The position is variable (i.e., determined by a rule.) The dimension orthogonal to the layout path is maximum for the position; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinate blocks.

REQUIRED

--Generic--

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(frame)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class-Identifier</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Position</td>
<td>(variable position(AS_8613))</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(#horizontal(default)</td>
</tr>
<tr>
<td>Logical-Source</td>
<td>(#vertical(Rule-B))</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>(OBJECT_CLASS_ID_OF(Hdr-</td>
</tr>
<tr>
<td></td>
<td>or-Ftr-Content))</td>
</tr>
<tr>
<td></td>
<td>(&quot;FrameH&quot;)</td>
</tr>
</tbody>
</table>

--Specific--

<table>
<thead>
<tr>
<th>Object-Identifier</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class</td>
<td>CASE</td>
</tr>
<tr>
<td></td>
<td>{iter(Block)}</td>
</tr>
<tr>
<td>Subordinates</td>
<td>{OBJECT_ID_OF(Block)}</td>
</tr>
<tr>
<td></td>
<td>{OBJECT_CLASS_ID_OF(Hdr- or-</td>
</tr>
<tr>
<td></td>
<td>Ftr-Content)}</td>
</tr>
<tr>
<td></td>
<td>{variable position(AS_8613)}</td>
</tr>
</tbody>
</table>

PERMITTED

--Generic--

<table>
<thead>
<tr>
<th>Resource</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Path</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Generator-for-Subordinates</td>
<td>(iter(Block))</td>
</tr>
</tbody>
</table>

--Specific--

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(frame)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class</td>
<td>CASE</td>
</tr>
<tr>
<td></td>
<td>{OBJECT_CLASS_ID_OF(FrameH)}</td>
</tr>
<tr>
<td></td>
<td>{N/A}</td>
</tr>
<tr>
<td>Position</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Field</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(#horizontal{default})</td>
</tr>
<tr>
<td></td>
<td>(#vertical{AS_8613})</td>
</tr>
<tr>
<td>User-Readable-Comments</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>User-Visible-Name</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Path</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>(&quot;FrameH&quot;)</td>
</tr>
</tbody>
</table>
Frame I: A region of the page typically representing a column. The frame may contain any substructure of further frames of any of the types C, F, or G. Blocks are not permitted directly subordinate to Frame I. Frame I is at a fixed position within its superior frame. The dimension orthogonal to the layout path is fixed; in the direction of the layout path, the dimension is the minimum size needed to contain the subordinates.

**REQUIRED**

---Generic---

<table>
<thead>
<tr>
<th>Object-Type</th>
<th>(frame)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Class-Identifier</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Generator-for-Subordinates</td>
<td>iter(any(FrameC, FrameF, FrameG))</td>
</tr>
<tr>
<td>Position</td>
<td>(#fixed(A8_8613))</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(#horizontal(fixed, default), vertical(Rule-B))</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>(&quot;FrameI&quot;)</td>
</tr>
</tbody>
</table>

---Specific---

| Object-Identifier     | (AS_8613) |
| Object-Class          | CASE |
|                       | fda    | (N/A) |
|                       | fpda   | {OBJECT_CLASS_ID_OF(FrameI)} |
| Subordinates          | (AS_8613) |

**PERMITTED**

---Generic---

| Resource               | (AS_8613) |
| User-Readable-Comments | (AS_8613) |
| User-Visible-Name      | (AS_8613) |
| Border                 | (AS_8613) |
| Transparency           | (AS_8613) |
| Colour                 | (AS_8613) |
| Layout-Path            | (90,270) |

---Specific---

<p>| Object-Type            | (frame) |
| Object-Class           | CASE |
|                       | fda    | (N/A) |
|                       | fpda   | (AS_8613) |
| Position               | (AS_8613) |
| Dimensions             | (AS_8613) |
| User-Readable-Comments | (AS_8613) |</p>
<table>
<thead>
<tr>
<th>User-Visible-Name</th>
<th>(AS_8613)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Transparency</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Colour</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Layout-Path</td>
<td>(90,270)</td>
</tr>
<tr>
<td>Imaging-Order</td>
<td>(AS_8613)</td>
</tr>
<tr>
<td>Application-Comments</td>
<td>(&quot;FrameI&quot;)</td>
</tr>
</tbody>
</table>
Frame J

Frame J is a single basic frame to contain header or footer contents. This is provided for compatibility with the CCITT Recommendation T.502.

REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier {AS_8613}
Logical-Source {AS_8613}
Application-Comments "Frame J"

--Specific--

Object-Class (OBJECT_CLASS_ID_OF(FRAME J))
Subordinates (OBJECT_ID_OF(Block))
Object-Identifier {AS_8613}

PERMITTED

--Generic--

Position (#fixed(AS_8613))
Dimensions (#fixed(AS_8613))
User-visible-name {AS_8613}
User-readable-comments {AS_8613}

--Specific--

Object-Type (frame)
Position (AS_8613)
Dimensions (#fixed(AS_8613))
User-visible-name (AS_8613)
User-readable-comments (AS_8613)
Application-Comments "Frame J"
Layout-Path (270)

RELATIONS

FrameJ.2#Position#y > FrameK.1#Position#y + FrameK.1#Dimensions#vertical

Note: the relations formulae are used to satisfy the constraint that Header frames, Body frames and Footer frames must not overlap. It is also assumed that the bottom of a header frame must be higher up on the page than the top of either a body frame or a footer frame, and that the bottom of a body frame must be higher up on the page than the top of a footer frame.
Frame K

Frame K is a single basic frame to represent the body area of a page. This is provided for compatibility with the CCITT Recommendation T.502.

REQUIRED

--Generic--

Object-Type (frame)
Object-Class-Identifier (AS_8613)
Application-Comments ("Frame K")

--Specific--

Object-Class {OBJECT_CLASS_ID_OF(FRAME K)}
Subordinates {OBJECT_ID_OF(Block)}
Object-Identifier (AS_8613)

PERMITTED

--Generic--

Position (#fixed(AS_8613))
Dimensions (#fixed(AS_8613))
User-visible-name (AS_8613)
User-readable-comments (AS_8613)

--Specific--

Object-Type (frame)
Position (AS_8613)
Dimensions (#fixed(AS_8613))
User-visible-name (AS_8613)
User-readable-comments (AS_8613)
Application-Comments ("Frame K")
Layout-Path (270)

RELATIONS

FrameK.1#Position#y > FrameJ.1#Position#y + FrameJ.1#Dimensions#vertical

Note: the relations formulae are used to satisfy the constraint that Header frames, Body frames and Footer frames must not overlap. It is also assumed that the bottom of a header frame must be higher up on the page than the top of either a body frame or a footer frame, and that the bottom of a body frame must be higher up on the page than the top of a footer frame.
REQUIRED

--Generic--

Object-Type                (block)
Object-Class-Identifier    (AS_8613)
Content-Architecture-Class (AS_8613)
Application-Comments       ("Block")

--Specific--

Content-Architecture-Class (AS_8613)
Position                   (AS_8613)
Dimensions                 (AS_8613)
Object-Identifier          (AS_8613)
Object-Class               CASE

fda        (N/A)
fpda        (OBJECT_CLASS_ID_OF(Block))

PERMITTED

--Generic--

Resource                  (AS_8613)
Content-Portions          (AS_8613)
User-Readable-Comments    (AS_8613)
User-Visible-Name         (AS_8613)
Transparency              (AS_8613)
Colour                    (AS_8613)
Border                    (AS_8613)
Presentation-Style        (AS_8613)

--Specific--

Object-Type                (block)
Object-Class               CASE

fda        (OBJECT_CLASS_ID_OF(Block))
fpda        (N/A)

Position                   (AS_8613)
Dimensions                 (AS_8613)
Content-Generator          (<content-generator-3>)
Content-Portions           (AS_8613)
User-Readable-Comments     (AS_8613)
User-Visible-Name          (AS_8613)
Transparency               (AS_8613)
Colour                     (AS_8613)
Border                     (AS_8613)
Presentation-Style         (AS_8613)
Application-Comments       ("Block")
2.2.5 CONTENT-ARCHITECTURE

2.2.5.1 Character-Content-Architecture

For the purposes of conformance, the character content architecture section presents all character content attributes in terms of default, basic and non-basic values. Defaults are presented here where they can be described in simple terms. In three cases where the values are determined algorithmically from other attribute values, reference is made to the description in IS 8613. Basic and non-basic values are supplied for each attribute. In addition, the domain of applicability for each attribute is also defined in terms of classes of content architectures. Particular areas where attributes of the standard are restricted for BASIC systems include character set support and line spacing.

### Presentation-Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alignment</strong></td>
<td>{start-aligned</td>
<td>end-aligned</td>
<td>centered</td>
<td>justified}</td>
</tr>
<tr>
<td><strong>Character-Fonts</strong></td>
<td>{Font-Size}</td>
<td>(NONE)</td>
<td>(ANY)</td>
<td>(NONE)</td>
</tr>
<tr>
<td><strong>Character-Path</strong></td>
<td>(0</td>
<td>90</td>
<td>180</td>
<td>270)</td>
</tr>
<tr>
<td>Character-Spacing</td>
<td>BASIC</td>
<td>(AS_8613)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(120)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CLASS</td>
<td>(cf</td>
<td>cp</td>
<td>cfp)</td>
</tr>
</tbody>
</table>

| Code-Extension-Announcer | BASIC  | (AS_8613) |
|                         | NON-BASIC | (NONE)  |
|                         | DEFAULT   | (AS_8613) |
|                         | CLASS     | (cf|cp|cfp) |

| First-Line-Offset | BASIC  | (AS_8613) |
|                  | NON-BASIC | (NONE)  |
|                  | DEFAULT   | (0)     |
|                  | CLASS     | (cf|cp|cfp) |

| Formatting-Indicator | BASIC  | (yes|no) |
|                     | NON-BASIC | (NONE)  |
|                     | DEFAULT   | (NONE)  |
|                     | CLASS     | (cf|cp|cfp) |

| Graphic-Character-Sets | BASIC  | (04/00,SO) |
|                        | (02/09 06/12,SI) |
|                        | (04/02,SO) |
|                        | (02/13 04/01,SI) |
|                        | (04/02,SO) |
|                        | (02/09 06/12,SI) |
|                        | (cf|cp|cfp) |

| Graphic-Rendition | BASIC  | (AS_8613) |
|                  | NON-BASIC | (NONE)  |
|                  | DEFAULT   | (0)     |

2-92
CLASS (cf cp cfp)

Indentation
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf cp cfp)

Initial-Offset
{ (Horizontal-Coordinate
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (AS_8613)
CLASS (cf cp cfp))
(Vertical-Coordinate
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (AS_8613)
CLASS (cf cp cfp))
}

Itemization
{ (Identifier-Alignment
BASIC (no-itemization|
start-aligned|
end-aligned)
NON-BASIC (NONE)
DEFAULT (no-itemization)
CLASS (cf cp cfp))
(Identifier-Start-Offset
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (AS_8613)
CLASS (cf cp cfp))
(Identifier-End-Offset
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf cp cfp))
}

Kerning-Offset
{ (Start-Edge-Offset
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf cp cfp))
(End-Edge-Offset
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf cp cfp))
}

Line-Layout-Table
{ (Tab-Reference
BASIC (AS_8613)
}

2-93
(Tab-Position)

BASIC {AS_8613}
NON-BASIC {NONE}
DEFAULT {NONE}
CLASS {cf|cp|cfp}

(Alignment)

BASIC {start-aligned, end-aligned, centered, aligned-around}
NON-BASIC {NONE}
DEFAULT {start-aligned}
CLASS {cf|cp|cfp}

(Alignment-String)

BASIC {AS_8613}
NON-BASIC {NONE}
DEFAULT {NONE}
CLASS {cf|cp|cfp}

Line-Progression

BASIC {90, 270}
NON-BASIC {NONE}
DEFAULT {270}
CLASS {cf|cp|cfp}

Line-Spacing

BASIC {100, 150, 200, 300, 400}
NON-BASIC {NONE}
DEFAULT {200}
CLASS {cf|cp|cfp}

Orphan-Size

BASIC {AS_8613}
NON-BASIC {NONE}
DEFAULT {1}
CLASS {cp|cfp}

Pairwise-Kerning

BASIC {yes, no}
NON-BASIC {NONE}
DEFAULT {no}
CLASS {cf|cp|cf}

Proportional-Line-Spacing

BASIC {yes, no}
NON-BASIC {NONE}
DEFAULT {no}
CLASS {cp|cfp}

Widow-Size

BASIC {AS_8613}
NON-BASIC {NONE}
DEFAULT {1}
CLASS {cp|cfp}

2-94
<table>
<thead>
<tr>
<th>Control-Functions</th>
</tr>
</thead>
</table>

Break-Permitted-Here
/*BPH*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>(cp</td>
</tr>
</tbody>
</table>

Carriage-Return
/*CR*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>(cf</td>
</tr>
</tbody>
</table>

Graphic-Character-Composition
/*GCC*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0</td>
<td>1</td>
<td>2)</td>
<td>(NONE)</td>
</tr>
</tbody>
</table>

Character-Position-Backward
/*HPB*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(120)</td>
<td>(cf</td>
</tr>
</tbody>
</table>

Character-Position-Relative
/*HPR*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(120)</td>
<td>(cf</td>
</tr>
</tbody>
</table>

No-Justify
/*JFY*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0)</td>
<td>(NONE)</td>
<td>(0)</td>
<td>(cf</td>
</tr>
</tbody>
</table>

Line-Feed
/*LF*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>(cf</td>
</tr>
</tbody>
</table>

No-Break-Here
/*NEH*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>(cp</td>
</tr>
</tbody>
</table>

Partial-Line-Down
/*PLD*/

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td></td>
</tr>
</tbody>
</table>

2-95
CLASS (cf|cp|cfp)

Partial-Line-Up
/*PLU*/
BASIC (NO-PARAMETERS)
NON-BASIC (N/A)
DEFAULT (N/A)
CLASS (cf|cp|cfp)

Parallel-Texts
/*PTX*/
BASIC (0|1|3)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf|cp)

Set-Additional-Character-Separation
/*SACS*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf|cp|cfp)

Set-Character-Spacing
/*SCS*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (120)
CLASS (cf|cp|cfp)

Select-Graphic-Rendition
/*SGR*/
BASIC (0|1|2|3|4|5|6|7|9|10|11|12|13|14|15|16|17|18|19|21|22|23|24|25|27|29)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf|cp|cfp)

Select-Character-Spacing
/*SHS*/
BASIC (0|1|2|3)
NON-BASIC (4)
DEFAULT (0)
CLASS (cf|cp|cfp)

Set-Line-Spacing
/*SLS*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (200)
CLASS (cf|cp|cfp)

Start-Of-String
/*SOS*/
BASIC (NO-PARAMETERS)
NON-BASIC (N/A)
DEFAULT (N/A)
CLASS (cfp)

Space
/*SP*/
BASIC (NO-PARAMETERS)
NON-BASIC (N/A)
Set-Reduced-Character-Separation
/*SRCS*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT {0}
CLASS (cf|cp|cfp)

Start-Reverse-String
/*SRS*/
BASIC (0|1)
NON-BASIC (NONE)
DEFAULT {0}
CLASS (cf|cp|cfp)

Set-Space-Width
/*SSW*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (NONE)
CLASS (cf|cfp)

String-Terminator
/*ST*/
BASIC (N/A)
NON-BASIC (N/A)
DEFAULT (N/A)
CLASS (cf|cfp)

Selective-Tabulation
/*STAB*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (NONE)
CLASS (cf|cp|cfp)

Substitute-Character
/*SUB*/
BASIC (NO-PARAMETERS)
NON-BASIC (N/A)
DEFAULT (N/A)
CLASS (cf|cp|cfp)

Select-Line-Spacing
/*SVS*/
BASIC (0|1|2|3|4|9)
NON-BASIC (NONE)
DEFAULT (0)
CLASS (cf|cp|cfp)

Line-Position-Backward
/*VPB*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (100)
CLASS (cf|cp|cfp)

Line-Position-Relative
/*VPR*/
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (100)
CLASS \( (cf|cp|cfp) \)

Code-Extension-Control
- BASIC \( \{ \text{AS}_8613 \} \)
- NON-BASIC \( \{ \text{NONE} \} \)
- DEFAULT \( \{ \text{NO-DEFAULT} \} \)
- CLASS \( (cf|cp|cfp) \)

Content-Portion-Attributes

Type-of-coding
- BASIC \( \{(2\ 8\ 3\ 6\ 0)\} \)
- NON-BASIC \( \{ \text{NONE} \} \)
- DEFAULT \( \{(2\ 8\ 3\ 6\ 0)\} \)
- CLASS \( (cf|cp|cfp) \)
### 2.2.5.2 Raster-Graphics-Content-Architecture

The Raster Graphics Content Architecture permits the inclusion in documents of content portions containing raster graphics which represent a two-dimensional pictorial image in the form of a rectangular two-dimensional array of picture elements (pels). The content architecture is as specified in part 7 of ISO 8613.

The Raster Graphics Content Architecture defines a formatted processable content architecture. This content architecture class supports Presentation Attributes and Content Portion Attributes. Each attribute comprising this content architecture is specified in subsequent sections in a form that has been defined previously. For each attribute, permissible values are differentiated as BASIC, NON-BASIC and DEFAULT.

#### Presentation Attributes

These attributes specify constraints and initial conditions relating to the layout and imaging of a raster graphics content portion. This content architecture class supports Shared Presentation Attributes and Logical Presentation Attributes.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pel-Path</td>
<td>{0 90 180 270}</td>
<td>(NONE)</td>
<td>(0)</td>
</tr>
<tr>
<td>Line-Progression</td>
<td>{90 270}</td>
<td>(NONE)</td>
<td>(270)</td>
</tr>
<tr>
<td>Pel-Spacing</td>
<td>(Length)</td>
<td>(AS_8613)</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>(Pel-Spaces)</td>
<td>(AS_8613)</td>
<td>(1)</td>
</tr>
<tr>
<td>Spacing-Ratio</td>
<td>(Line-Spacing-Value)</td>
<td>(AS_8613)</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>(Pel-Spacing-Value)</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
</tr>
</tbody>
</table>
Clipping
{
(First-Pair-X-Coordinate
  BASIC {AS_8613}
  NON-BASIC {NONE}
  DEFAULT {AS_8613}
(First-Pair-Y-Coordinate
  BASIC {AS_8613}
  NON-BASIC {NONE}
  DEFAULT {AS_8613}
(Second-Pair-X-Coordinate
  BASIC {AS_8613}
  NON-BASIC {NONE}
  DEFAULT {AS_8613}
(Second-Pair-Y-Coordinate
  BASIC {AS_8613}
  NON-BASIC {NONE}
  DEFAULT {AS_8613}
}

Image-Dimensions
  BASIC {CHOICE-OF
    (Width-Controlled (SEQUENCE-OF
      (Minimum-Width
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
      (Preferred-Width
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
    )
    (Height-Controlled (SEQUENCE-OF
      (Minimum-Height
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
      (Preferred-Height
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
    )
    (Area-Controlled (SEQUENCE-OF
      (Minimum-Width
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
      (Preferred-Width
        BASIC {AS_8613}
        NON-BASIC {NONE}
        DEFAULT {NO-DEFAULT}}
    (Minimum-Height
      2-100
    )
  )
}
<table>
<thead>
<tr>
<th>Attribute</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred-Height</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(NO-DEFAULT)</td>
</tr>
<tr>
<td>Aspect-Ratio-Flag</td>
<td>(variable</td>
<td>fixed)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Automatic</td>
<td>(NO-PARAMETERS)</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
</tbody>
</table>

Content-Portion-Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number-of-Pels-Per-Line</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Number-of-Lines</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Type-of-coding</td>
<td>{{2 8 3 7 0}</td>
<td></td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>/<em>CCITT T.6</em>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2 8 3 7 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>/<em>CCITT T.4 1-Dimensional</em>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2 8 3 7 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>/<em>CCITT T.4 2-Dimensional</em>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2 8 3 7 3))</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>/<em>Bitmap</em>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression</td>
<td>(compressed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>uncompressed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(NONE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(compressed)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2-101
Geometric Graphics Content Architecture

The Geometric Graphics Content Architecture permits the inclusion in documents of content portions containing graphics primitives such as lines, markers, filled areas, graphic text, patterns and etc. The content architecture is as specified in part 8 of ISO 8613. It is based on ISO 8632, Computer Graphics Metafile (CGM).

The Geometric Graphics Content Architecture defines a formatted processable content architecture. This content architecture class supports Presentation Attributes, Content Architecture Class Attributes and Content Portion Attributes. Each attribute comprising this content architecture is specified in subsequent sections in a form that has been defined previously. For each attribute, permissible values are differentiated as BASIC, NON-BASIC and DEFAULT.

Presentation Attributes

These attributes specify constraints and initial conditions relating to the layout and imaging of a geometric graphics content portion. This content architecture class supports Presentation Attributes.

The default values for the presentation attributes are specified so as to be consistent with those specified in the Metafile Defaults in clause 6 of ISO 8632/1. No private values are permitted for any of the presentation attributes.

Default-Bundle-Representations

<table>
<thead>
<tr>
<th>Line-Bundle-Representation</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Bundle-Index)</td>
<td>(1,2,3,4,5)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>(Line-Type)</td>
<td>solid, dash, dot, dash-dot, dash-dot-dot</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>(Line-Width)</td>
<td>CASE Line-Width-Specification-Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>absolute</td>
<td>BASIC</td>
<td>(.001<em>max-vdcx, .001</em>max-vdcx, .001<em>max-vdcx, .001</em>max-vdcx, .001*max-vdcx)</td>
<td>(NONE)</td>
</tr>
</tbody>
</table>
scaled
DEFAULT (N/A)
BASIC {1.,1.,1.,1.,1.}
NON-BASIC (NONE)
DEFAULT (N/A)

(Line-Colour CASE Colour-Specification-Mode
indexed BASIC {1,1,1,1,1}
NON-BASIC (NONE)
DEFAULT (N/A)
direct BASIC (foreground,
foreground,
foreground,
foreground,
foreground)
NON-BASIC (NONE)
DEFAULT (N/A)

)

Marker-Bundle-Representation {
(Bundle-Index BASIC {1,2,3,4,5}
NON-BASIC (NONE)
DEFAULT (N/A)
(Marker-Type BASIC (dot,
plus,
asterisk,
circle,
cross)
NON-BASIC (NONE)
DEFAULT (N/A)

(Marker-Size CASE Marker-Size-Specification-Mode
absolute BASIC {0.01*max-vdcx,
0.01*max-vdcx,
0.01*max-vdcx,
0.01*max-vdcx,
0.01*max-vdcx}
NON-BASIC (NONE)
DEFAULT (N/A)
scaled BASIC {1.,1.,1.,1.,1.}
NON-BASIC (NONE)
DEFAULT (N/A)

(Marker-Colour CASE Colour-Specification-Mode
indexed BASIC {1,1,1,1,1}
NON-BASIC (NONE)
DEFAULT (N/A)
direct BASIC (foreground,
foreground,
foreground,
foreground,
foreground)
NON-BASIC (NONE)
DEFAULT (N/A)

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Text-Bundle-Representation

(Bundle-Index
BASIC (1,2)
NON-BASIC (NONE)
DEFAULT (N/A))

(Text-Font-Index
BASIC (1,1)
NON-BASIC (NONE)
DEFAULT (N/A))

(Text-Precision
BASIC (string, character)
NON-BASIC (NONE)
DEFAULT (N/A))

(Character-Expansion-Factor
BASIC (1.0, 0.7)
NON-BASIC (NONE)
DEFAULT (N/A))

(Character-Spacing
BASIC (0.0, 0.0)
NON-BASIC (NONE)
DEFAULT (N/A))

(Text-Colour
CASE Colour-Specification-Mode
indexed
BASIC (1,1)
NON-BASIC (NONE)
DEFAULT (N/A))

direct
BASIC (foreground, foreground)
NON-BASIC (NONE)
DEFAULT (N/A))

Filled-Area-Bundle-Representation

(Fill-Bundle-Index
BASIC (1,2,3,4,5)
NON-BASIC (NONE)
DEFAULT (N/A))

(Interior-Style
BASIC (hollow, hatch, hatch, hatch)
NON-BASIC (NONE)
DEFAULT (N/A))

(Fill-Colour
CASE Colour-Specification-Mode
indexed
BASIC (1,1,1,1,1)
NON-BASIC (NONE)
DEFAULT (N/A))

direct
BASIC (foreground, foreground, foreground, foreground, foreground)
Hatch-Index

- **BASIC**:
  - horizontal, horizontal, vertical, positive-slope, negative-slope
- **NON-BASIC**:
  - NONE
- **DEFAULT**:
  - N/A

Pattern-Index

- **BASIC**:
  - (1,1,1,1,1)
- **NON-BASIC**:
  - NONE
- **DEFAULT**:
  - N/A

Edge-Bundle-Representation

- **Bundle-Index**
  - **BASIC**:
    - (1,2,3,4,5)
  - **NON-BASIC**:
    - NONE
  - **DEFAULT**:
    - N/A

- **Edge-Type**
  - **BASIC**:
    - solid, dash, dot, dash-dot, dash-dot-dot
  - **NON-BASIC**:
    - NONE
  - **DEFAULT**:
    - N/A

- **Edge-Width**
  - **CASE** Edge-Width-Specification-Mode
    - **absolute**
      - **BASIC**:
        - 0.001*max-vdcx, 0.001*max-vdcx, 0.001*max-vdcx, 0.001*rax-vdcx, 0.001*max-vdcx
      - **NON-BASIC**:
        - N/A
      - **DEFAULT**:
        - N/A
    - **scaled**
      - **BASIC**:
        - (1.,1.,1.,1.,1.)
      - **NON-BASIC**:
        - NONE
      - **DEFAULT**:
        - N/A

- **Edge-Colour**
  - **CASE** Colour-Specification-Mode
    - **indexed**
      - **BASIC**:
        - (1,1,1,1,1)
      - **NON-BASIC**:
        - NONE
      - **DEFAULT**:
        - N/A
    - **direct**
      - **BASIC**:
        - foreground, foreground, foreground, foreground, foreground
      - **NON-BASIC**:
        - NONE
      - **DEFAULT**:
        - N/A

Default-Pattern-Representation

- **CASE**
  - **absolute**
  - **scaled**

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{Pattern-Table-Index
  BASIC (1)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

{Number-Of-Columns
  BASIC (1)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

{Number-Of-Rows
  BASIC (1)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

{Local-Colour-Precision
  BASIC (0)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

{Colour-Array Case Colour-Specification-Mode
  indexed
  BASIC (1)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

  direct
  BASIC (foreground)
  NON-BASIC (NONE)
  DEFAULT (N/A)}

Default-Colour-Representation {
  /* See Note 1 */
  (Start-Index
    BASIC (2)
    NON-BASIC (NONE)
    DEFAULT (N/A)}

  (Colour-List
    BASIC {
      /* Red */    (255, 0, 0),
      /* Green */  (0, 255, 0),
      /* Blue */   (0, 0, 255),
      /* Yellow */ (255, 255, 0),
      /* Magenta */(255, 0, 255),
      /* Cyan */   (0, 255, 255),
      /* Black */  (0, 0, 0),
      /* White */  (255, 255, 255))
    NON-BASIC (NONE)
    DEFAULT (N/A)}
}

/* Note 1  Colour Table defaults for colour indices 0 and 1
  are defined to the nominal "background" and
  nominal "foreground" colours, respectively. */

Geometric-Graphics-Encoding-Announcer

VDC-Type BASIC (integer|real)
           NON-BASIC (NONE)
           DEFAULT (integer)

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<table>
<thead>
<tr>
<th>Feature</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer-Precision</td>
<td>(16</td>
<td>32)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Real-Precision</td>
<td>((0,9,23)</td>
<td></td>
<td>(1,16,16))</td>
</tr>
<tr>
<td>Index-Precision</td>
<td>(8</td>
<td>16)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Colour-Precision</td>
<td>(8</td>
<td>16)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Colour-Index-Precision</td>
<td>(8</td>
<td>16)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>Maximum-Colour-Index</td>
<td>(ANY colour-index)</td>
<td>(NONE)</td>
<td>(63)</td>
</tr>
<tr>
<td>Colour-Value-Extent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Minimum-Colour-Direct</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>(0,0,0))</td>
</tr>
<tr>
<td></td>
<td>(Maximum-Colour-Direct</td>
<td>(ANY colour-direct)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>(255,255,255))</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colour-Selection-Mode</td>
<td>(indexed</td>
<td>direct)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>VDC-Integer-Precision</td>
<td>(16</td>
<td>32)</td>
<td>(NONE)</td>
</tr>
<tr>
<td>VDC-Real-Precision</td>
<td>((0,9,23)</td>
<td></td>
<td>(1,16,16))</td>
</tr>
</tbody>
</table>
Line-Rendition

Line-Width-Specification-Mode
BASIC (absolute|scaled)
NON-BASIC (NONE)
DEFAULT (scaled)

Line-Bundle-Index
BASIC (ANY INDEX)
NON-BASIC (NONE)
DEFAULT (1)

Line-Type
BASIC (solid,
dash,
dot,
dash-dot,
dash-dot-dot)
NON-BASIC (NONE)
DEFAULT (solid)

Line-Width
CASE Line-Width-Specification-Mode
    absolute BASIC (ANY POSITIVE vdc)
        NON-BASIC (NONE)
        DEFAULT (0.001*max-vdcx)
    scaled BASIC (ANY POSITIVE real)
        NON-BASIC (NONE)
        DEFAULT (1.0)

Line-Colour
CASE Colour-Specification-Mode
    indexed BASIC (ANY colour-index)
        NON-BASIC (NONE)
        DEFAULT (1)
    direct BASIC (ANY colour-direct)
        NON-BASIC (NONE)
        DEFAULT (foreground)

Line-Aspect-Source-Flags
(Line-Type-ASF BASIC (bundled
    individual)
        NON-BASIC (NONE)
        DEFAULT (individual))
(Line-Width-ASF BASIC (bundled
    individual)
        NON-BASIC (NONE)
        DEFAULT (individual))
(Line-Colour-ASF BASIC (bundled
    individual)
        NON-BASIC (NONE)
        DEFAULT (individual))

Line-Bundle-Specifications
/* Any bundle consisting of parameters as for individual */

BASIC  {AS_8613}
NON-BASIC  {NONE}
DEFAULT  {N/A}

Marker-Rendition

Marker-Size-Specification-Mode
BASIC  (absolute|scaled)
NON-BASIC  {NONE}
DEFAULT  (scaled)

Marker-Bundle-Index
BASIC  {ANY INDEX}
NON-BASIC  {NONE}
DEFAULT  (1)

Marker-Type
BASIC  {dot|plus|asterisk|circle|cross}
NON-BASIC  {NONE}
DEFAULT  {asterisk}

Marker-Size
CASE Marker-Size-Specification-Mode
  absolute  BASIC  {ANY POSITIVE vdc}
  NON-BASIC  {NONE}
  DEFAULT  {0.01*max-vdx}
  scaled  BASIC  {ANY POSITIVE real}
  NON-BASIC  {NONE}
  DEFAULT  {1.0}

Marker-Colour
CASE Colour-Specification-Mode
  indexed  BASIC  {ANY colour-index}
  NON-BASIC  {NONE}
  DEFAULT  {1}
  direct  BASIC  {ANY colour-direct}
  NON-BASIC  {NONE}
  DEFAULT  {foreground}

Marker-Aspect-Source-Flags
  {Marker-Type-ASF BASIC  {bundled individual}
     NON-BASIC  {NONE}
     DEFAULT  {individual})
  (Marker-Size-ASF BASIC  {bundled individual}
     NON-BASIC  {NONE}
     DEFAULT  {individual})
  (Marker-Colour-ASF BASIC  {bundled
Marker-Bundle-Specifications

/* Any bundle consisting of parameters as for individual */
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (N/A)

Text-Rendition

Font-List
BASIC {AS_8613}
NON-BASIC (NONE)
DEFAULT (NONE)

Character-Set-List
{Character-Set-Type
BASIC {94-character-G-set |
96-character-G-set}
NON-BASIC (NONE)
DEFAULT (94-character-G-set)}

{Designation-Sequence-Tail
BASIC {4/1 |
4/0 |
4/2 }
NON-BASIC (NONE)
DEFAULT (4/1)}

Character-Coding-Announcer
BASIC (basic-7-bit |
basic-8-bit)
NON-BASIC (NONE)
DEFAULT (basic-7-bit)

Text-Bundle-Index
BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (1)

Text-Font-Index
BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (NONE)

Text-Precision
BASIC (string |
character |
stroke)
NON-BASIC (NONE)
DEFAULT (string)

Character-Expansion-Factor
BASIC (ANY POSITIVE real)
NON-BASIC (NONE)
DEFAULT (1.0)

Character-Spacing
BASIC (ANY real)
NON-BASIC (NONE)
DEFAULT (0.0)

Text-Colour
CASE Colour-Specification-Mode
indexed BASIC (ANY colour-index)
NON-BASIC (NONE)
DEFAULT (1)
direct BASIC (ANY colour-direct)
NON-BASIC (NONE)
DEFAULT (foreground)

Character-Height
BASIC (ANY POSITIVE vdc)
NON-BASIC (NONE)
DEFAULT (0.01*max-vdcx)

Character-Orientation (X-Character-Up-Component
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (0))

(Y-Character-Up-Component
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (1))

(X-Character-Base-Component
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (1))

(Y-Character-Base-Component
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (0))

Text-Path
BASIC (right|left|up|down)
NON-BASIC (NONE)
DEFAULT (right)

Text-Alignment
(Horizontal-Alignment

2-111
BASIC (normal | left | center | right | continuous)
NON-BASIC (NONE)
DEFAULT (normal)

{Vertical-Alignment
BASIC (normal | left | center | right | continuous)
NON-BASIC (NONE)
DEFAULT (normal)

{Continuous-Horizontal-Alignment
BASIC (ANY real)
NON-BASIC (NONE)
DEFAULT (N/A)

{Continuous-Vertical-Alignment
BASIC (ANY real)
NON-BASIC (NONE)
DEFAULT (N/A)

Character-Set-Index BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (1)

Alternate-Character-Set-Index
BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (1)

Text-Aspect-Source-Flags
{Text-Font-ASF BASIC (bundled | individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Text-Precision-ASF
BASIC (bundled | individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Character-Expansion-Factor-ASF
BASIC (bundled | individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Character-Spacing-ASF
BASIC (bundled | individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Text-Colour-ASF BASIC (bundled|
individual)
NON-BASIC (NONE)
DEFAULT (individual))

Text-Bundle-Specifications
/* Any bundle consisting of parameters as for individual */
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (N/A)

Fill-Area-Rendition

Fill-Bundle-Index BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (1)

Interior-Style BASIC (hollow|
solid| pattern| hatch| empty)
NON-BASIC (NONE)
DEFAULT (hollow)

Fill-Colour
CASE Colour-Specification-Mode
indexed BASIC (ANY colour-index)
NON-BASIC (NONE)
DEFAULT (1)
direct BASIC (ANY colour-direct)
NON-BASIC (NONE)
DEFAULT (foreground)

Hatch-Index BASIC (horizontal|
vertical| positive-slope| negative-slope| vertical-hatch| cross-hatch)
NON-BASIC (NONE)
DEFAULT (horizontal)

Pattern-Index BASIC (1|2|3|4|5|6|7|8)
NON-BASIC (NONE)
DEFAULT (1)

Fill-Reference-Point BASIC (ANY point)
NON-BASIC (NONE)

2-113
Pattern-Size
{
(X-Component-Height-Vector
  BASIC {ANY vdc}
  NON-BASIC {NONE}
  DEFAULT {0})
(Y-Component-Height-Vector
  BASIC {ANY vdc}
  NON-BASIC {NONE}
  DEFAULT {vdcx})
(X-Component-Width-Vector
  BASIC {ANY vdc}
  NON-BASIC {NONE}
  DEFAULT {vdcx})
(Y-Component-Width-Vector
  BASIC {ANY vdc}
  NON-BASIC {NONE}
  DEFAULT {0})
}

Pattern-Table-Representation
{
(Pattern-Table-Index
  (Pattern-Table-Index
    BASIC {1|2|3|4|5|6|7|8}
    NON-BASIC {NONE}
    DEFAULT {N/A}
  )
  (Number-Of-Columns
    BASIC {1..16}
    NON-BASIC {NONE}
    DEFAULT {1})
  (Number-Of-Rows
    BASIC {1..16}
    NON-BASIC {NONE}
    DEFAULT {1})
  (Local-Colour-Precision
    BASIC {0|1|8|16}
    NON-BASIC {NONE}
    DEFAULT {0})
  (Colour-Array
    indexed BASIC {1.8*1.16*1.16* ANY colour-index}
    NON-BASIC {NONE}
    DEFAULT {1}
    direct BASIC {1.8*1.16*1.16* ANY colour-direct}
    NON-BASIC {NONE}
    DEFAULT {foreground}
  )
)

Fill-Aspect-Source-Flags
{
(Interior-Style-ASF

2-114
Fill-Colour-ASF
(BASIC (bundled individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Hatch-Index-ASF
BASIC (bundled individual)
NON-BASIC (NONE)
DEFAULT (individual))

(Pattern-Index-ASF
BASIC (bundled individual)
NON-BASIC (NONE)
DEFAULT (individual))

Fill-Bundle-Specifications
/* Any bundle consisting of parameters as for individual */
BASIC {AS_8613}
NON-BASIC (NONE)
DEFAULT (N/A)

Edge-Rendition

Edge-Width-Specification-Mode
BASIC (absolute|scaled)
NON-BASIC (NONE)
DEFAULT (scaled)

Edge-Bundle-Index
BASIC (ANY index)
NON-BASIC (NONE)
DEFAULT (1)

Edge-Visibility
BASIC (off|on)
NON-BASIC (NONE)
DEFAULT (off)

Edge-Type
BASIC {solid|dash|dot|dash-dot|dash-dot-dot}
NON-BASIC (NONE)
DEFAULT (solid)

Edge-Width
CASE Line-Width-Specification-Mode
2-115
absolute BASIC (POSITIVE vdc)
NON-BASIC (NONE)
DEFAULT (0.001*max-vdcx)
scaled BASIC (POSITIVE real)
NON-BASIC (NONE)
DEFAULT (1.0)

Edge-Colour
CASE Colour-Specification-Mode
  indexed BASIC (ANY colour-index)
  NON-BASIC (NONE)
  DEFAULT (1)
  direct BASIC (ANY colour-direct)
  NON-BASIC (NONE)
  DEFAULT (foreground)

Edge-Aspect-Source-Flags
  (Edge-Type-ASF BASIC (bundled
  individual)
  NON-BASIC (NONE)
  DEFAULT (individual))
  (Edge-Width-ASF BASIC (bundled
  individual)
  NON-BASIC (NONE)
  DEFAULT (individual))
  (Edge-Colour-ASF BASIC (bundled
  individual)
  NON-BASIC (NONE)
  DEFAULT (individual))

Edge-Bundle-Specifications
/* Any bundle consisting of parameters as for individual */
BASIC (AS_8613)
NON-BASIC (NONE)
DEFAULT (N/A)

Colour-Representation
Background-Colour BASIC (ANY colour-direct)
NON-BASIC (NONE)
DEFAULT (background)

Colour-Table-Specification
  (Start-Index BASIC (1..
  Maximum-Colour-Index)
  NON-BASIC (NONE)
  DEFAULT (N/A))
  (Colour-List BASIC (ANY Colour-List)
  NON-BASIC (NONE)
  DEFAULT (N/A))
Transparency-Specification

| Transparency       | BASIC   | {off|on}   |
|--------------------|---------|-----------|
|                    | NON-BASIC | (NONE)    |
|                    | DEFAULT  | (on)      |

Auxiliary-Colour

indexed

<table>
<thead>
<tr>
<th>CASE Colour-Specification-Mode</th>
<th>BASIC</th>
<th>(ANY colour-index)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0)</td>
</tr>
</tbody>
</table>

direct

<table>
<thead>
<tr>
<th>CASE Colour-Specification-Mode</th>
<th>BASIC</th>
<th>(ANY colour-direct)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(background)</td>
</tr>
</tbody>
</table>

Transformation-Specification

VDC-Extent

CASE VDC-Type

integer

{(X-Coordinate-First-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0)       }
{(Y-Coordinate-First-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0)       }
{(X-Coordinate-Second-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (32767)   }
{(Y-Coordinate-Second-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (32767)   }

real

{(X-Coordinate-First-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0.0)     }
{(Y-Coordinate-First-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0.0)     }
{(X-Coordinate-Second-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0.9999)  }
{(Y-Coordinate-Second-Point
  BASIC    | (ANY vdc) |
  NON-BASIC | (NONE)    |
  DEFAULT   | (0.9999)  }

2-117
Clip-Rectangle CASE VDC-Type
integer

{{X-Coordinate-First-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0)}
{Y-Coordinate-First-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0)}
{X-Coordinate-Second-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (32767)}
{Y-Coordinate-Second-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (32767)}}

real

{{X-Coordinate-First-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0.0)}
{Y-Coordinate-First-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0.0)}
{X-Coordinate-Second-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0.9999)}
{Y-Coordinate-Second-Point
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (0.9999)}}

}Clip-Indicator BASIC (off|on)
NON-BASIC (NONE)
DEFAULT (on)

Region-Of-Interest BASIC (rectangle| automatic)
NON-BASIC (NONE)
DEFAULT (automatic)

Picture-Orientation BASIC (0|90|180|270)
NON-BASIC (NONE)
DEFAULT (0)
Content Architecture Class Attributes

These attributes identify and describe the content architecture class of a content portion specified within object definitions.

Common-Coding-Attributes

Type-Of-Coding

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(automatic)</td>
</tr>
</tbody>
</table>

Content-Information

The content information of a content portion description that conforms to this content architecture is an ASN.1 octet string representing a Computer Graphics Metafile (CGM) conforming to the following constraints.

a) Conform to part 1 of the ISO 8632 standard;

b) Conform to the binary encoding defined in part 3 of the ISO 8632 standard;

c) Consist of a single picture;

d) Conform to the CGM implementation agreement specified in section 6.2 of the Technical and Office Protocols Version 3.0 Recommendation, except as noted with respect to font and colour table support;

e) Generalized Drawing Primitives are ignored;

f) ESCAPE Elements are ignored;

g) External Elements may be ignored.

The following list is a description of the permitted values for the CGM elements.

Delimiter-Elements

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ANY octet-string)</td>
<td>(NONE)</td>
<td></td>
</tr>
</tbody>
</table>

2-119
/* See Note 1 */

Begin-Metafile

BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (null-string)

End-Metafile

BASIC (N/A)
NON-BASIC (NONE)
DEFAULT (N/A)

Begin-Picture

BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (null-string)

Begin-Picture-Body

BASIC (N/A)
NON-BASIC (NONE)
DEFAULT (N/A)

End-Picture

BASIC (N/A)
NON-BASIC (NONE)
DEFAULT (N/A)

Note 1: An arbitrary sequence of n octets. Where 
n=0,1,..,32767. The sequence of zero or more octets is 
for padding purposes.

Note 2: Support will be provided for strings with a length upto 
256 octets, except for data records which will support 
strings with a length up to 32767 octets.

Metafile-Description-Elements

Metafile-Version

BASIC (1)
NON-BASIC (NONE)
DEFAULT (N/A)

Metafile-Description

BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (null-string)

VDC-Type

BASIC (integer|real)
NON-BASIC (NONE)
DEFAULT (integer)

Integer-Precision

BASIC (16)
NON-BASIC (NONE)
DEFAULT (16)

Real-Precision

BASIC ((0,9,23])
(1,16,16))
<table>
<thead>
<tr>
<th>Feature</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Index-Precision</strong></td>
<td>(16)</td>
<td>(NONE)</td>
<td>(16)</td>
</tr>
<tr>
<td><strong>Colour-Precision</strong></td>
<td>(8</td>
<td>16)</td>
<td>(NONE)</td>
</tr>
<tr>
<td><strong>Colour-Index-Precision</strong></td>
<td>(8</td>
<td>16)</td>
<td>(NONE)</td>
</tr>
<tr>
<td><strong>Maximum-Colour-Index</strong></td>
<td>(ANY colour-index)</td>
<td>(NONE)</td>
<td>(63)</td>
</tr>
<tr>
<td><strong>Colour-Value-Extent</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>{MINIMUM-colour-direct}</td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>((0,0,0))</td>
</tr>
<tr>
<td>{MAXIMUM-colour-direct}</td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>((255,255,255))</td>
</tr>
<tr>
<td><strong>Metafile-Element-List</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>{Number-Of-Elements}</td>
<td>(ANY integer)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>{List-Of-Elements}</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td><strong>Metafile-Defaults-Replacement</strong></td>
<td>(AS_8613)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td><strong>Font-List</strong></td>
<td>(NONE)</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
</tr>
<tr>
<td><strong>Character-Set-List</strong></td>
<td>(94-character-G</td>
<td>(AS_8613)</td>
<td>(NONE)</td>
</tr>
</tbody>
</table>
/* See Note 5 */

/* See Note 5 */

DEFAULT (94-character-G
-set})

DEFAULT (9/4)

DEFAULT (0)

DEFAULT (0)

DEFAULT (0)

DEFAULT (0)

365x758) {NONE}

94-character-G
-set})

4/1}}}

Character-Coding-Announcer BASIC (0/1)

NON-BASIC (NONE)

DEFAULT (4/1))

Character-Coding-Announcer BASIC (0/1)

NON-BASIC (NONE)

DEFAULT (4/1))

/* Note 1: Support will be provided for strings with a length upto
256 octets, except for data records which will support
strings with a length upto 32767 octets.

Note 2: The METAFILE DESCRIPTION string parameter will be used
to include the sub-string "NBS/BASIC-1" to label the
content as conforming to this agreement.

In addition, generators of content conforming to this content
architecture are encouraged to include a sub-string that identifies
the company and product that produced the CGM.

Note 3: The basic, non-basic or default for this element is
different than that specified in the TOP Version 3.0
Recommendation for CGM.

Note 4: The METAFILE DEFAULTS REPLACEMENT element shall not be
partitioned. No part of the element will be
partitioned. Multiple occurrences of the METAFILE
DEFAULTS REPLACEMENT element may be used to avoid the
need for partitioning. The METAFILE DEFAULTS
REPLACEMENT element must appear in the content portion
conforming to this content architecture to establish
the defaults for TEXT PRECISION and any other elements
that do not assume the defaults specified in ISO 8632
parts 1 and 3.

Note 5: The character set ISO 646, 7-bit Coded Character Set
for Information Interchange, is specified with the
parameters (0,4/1).
The character set ISO 6937/2, Coded Character Sets for
Text Communication - Latin Alphabetic and Non-
alphabetic Graphic Characters, is specified with the
parameters (0,4/0).
The character set ISO 8859/1, 8-bit Single Byte Coded Graphic Character Sets - Latin Alphabet No. 1, is specified with the parameters (0,4/2).

Picture-Descriptor-Elements:

Scaling-Mode

{Scaling-Mode
(BASIC (abstract|metric)
NON-BASIC (NONE)
DEFAULT (abstract))

{Scale-Factor
abstract
BASIC (N/A)
NON-BASIC (N/A)
DEFAULT (N/A)

scaled
BASIC (ANY real)
NON-BASIC (NONE)
DEFAULT (25.4))

/* See Note 1 */
}

Colour-Selection-Mode

BASIC (indexed|direct)
NON-BASIC (NONE)
DEFAULT (indexed)

Line-Width-Specification-Mode

BASIC (absolute|scaled)
NON-BASIC (NONE)
DEFAULT (scaled)

Marker-Size-Specification-Mode

BASIC (absolute|scaled)
NON-BASIC (NONE)
DEFAULT (scaled)

Edge-Width-Specification-Mode

BASIC (absolute|scaled)
NON-BASIC (NONE)
DEFAULT (scaled)

VDC-Extent
integer

CASE VDC-Type

{(X-Coordinate-First-Point
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (0))

(Y-Coordinate-First-Point
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (0))

(X-Coordinate-Second-Point
BASIC (ANY vdc)
2-123
/* Note 1: The Scale-Factor parameter of SCALING MODE element is always a 32-bit floating point value, even when REAL PRECISION has selected fixed-point for other real numbers. It is not apparent in ISO 8632 what the precision of this floating point parameter is when fixed point reals have been selected. Its precision shall be (0,9,23). */

Control-Elements

VDC-Integer-Precision BASIC (16|32) 
NON-BASIC (NONE) 
DEFAULT (16) 

VDC-Real-Precision BASIC {{0 9 23} | 
{1 16 16}} 
NON-BASIC (NONE) 
DEFAULT {{1 16 16}}

Auxiliary-Colour indexed CASE Colour-Specification-Mode 
BASIC (ANY colour-index) 
NON-BASIC (NONE)
direct
  DEFAULT {0}
  BASIC {ANY colour-direct}
  NON-BASIC {NONE}
  DEFAULT {background}

Transparency
  BASIC {off|on}
  NON-BASIC {NONE}
  DEFAULT {on}

Clip-Rectangle
  CASE VDC-Type
    integer
      { (X-Coordinate-First-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0})
        (Y-Coordinate-First-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0})
        (X-Coordinate-Second-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {32767})
        (Y-Coordinate-Second-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {32767})}
    real
      { (X-Coordinate-First-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0.0})
        (Y-Coordinate-First-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0.0})
        (X-Coordinate-Second-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0.9999})
        (Y-Coordinate-Second-Point
         BASIC {ANY vdc}
         NON-BASIC {NONE}
         DEFAULT {0.9999})}

Clip-Indicator
  BASIC {off|on}
  NON-BASIC {NONE}
  DEFAULT {on}

Graphical-Primitive-Elements

Polyline
  BASIC {ANY point-list}

2-125
/* See Note 1 */

Disjoint-Polyline
BASIC (ANY point-list)
/* See Note 1 */

Polymarker
BASIC (ANY point-list)
/* See Note 1 */

Text
(No-Text-Position
BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))
(No-Final-Flag
BASIC (final|not-final)
NON-BASIC (NONE)
DEFAULT (N/A))
(No-Text-String
BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (N/A))
/* See Note 2 */

Restricted-Text
/* See Note 3 */
(Delta-Width
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (N/A))
(Delta-Height
BASIC (ANY vdc)
NON-BASIC (NONE)
DEFAULT (N/A))
(No-Text-Position
BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))
(No-Final-Flag
BASIC (final|not-final)
NON-BASIC (NONE)
DEFAULT (N/A))
(No-Text-String
BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (N/A))
/* See Note 2 */

Append-Text
(Final-Flag
BASIC (final|not-final)
NON-BASIC (NONE)
DEFAULT (N/A))
(Text-String
BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (N/A))
/* See Note 2 */

Polygon
BASIC (ANY point-list)

2-126
/* See Note 1 */

Polygon-Set

(VERTEX

BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))

(EDGE-OUT-FLAG

BASIC {invisible |
             visible |
             close-invisible |
             close-visible})
NON-BASIC (NONE)
DEFAULT (N/A))

Cell-Array

/* See Note 4 */

(Corner-P

BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))

(Corner-Q

BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))

(Corner-R

BASIC (ANY point)
NON-BASIC (NONE)
DEFAULT (N/A))

(Dimension-X

BASIC (ANY integer)
NON-BASIC (NONE)
DEFAULT (N/A))

(Dimension-Y

BASIC (ANY integer)
NON-BASIC (NONE)
DEFAULT (N/A))

(Local-Colour-Precision

BASIC {0, 1, 8, 16}
NON-BASIC (NONE)
DEFAULT (N/A))

(Cell-Representation-Mode

BASIC {rle, packed}
NON-BASIC (NONE)
DEFAULT (N/A))

(Cell-Colours-Values

CASE Colour-Representation-Mode

indexed BASIC (ANY colour-list)
NON-BASIC (NONE)
DEFAULT (N/A))

Rectangle

/* See Note 4 */

direct BASIC (ANY colour-list)
NON-BASIC (NONE)
DEFAULT (N/A))

/* See Note 4 */

(First-Corner

BASIC (ANY point)
NON-BASIC (NONE)

2-127
(Second-Corner
  DEFAULT (N/A))

  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A))

Circle
  (Centre
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Radius
    BASIC (ANY vdc)
    NON-BASIC (NONE)
    DEFAULT (N/A))

Circular-Arc-3-Point
  (Start-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Mid-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (End-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

Circular-Arc-3-Point-Close
  (Start-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Mid-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (End-Point
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Close-Type-Flag
    BASIC (pie-closure|
             chord-closure)
    NON-BASIC (NONE)
    DEFAULT (N/A))

Circular-Arc-Centre
  (Centre
    BASIC (ANY point)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Start-Delta-X
    BASIC (ANY vdc)
    NON-BASIC (NONE)
    DEFAULT (N/A))

  (Start-Delta-Y
    BASIC (ANY vdc)
    NON-BASIC (NONE)

2-128
<table>
<thead>
<tr>
<th>Parameter</th>
<th>BASIC Type</th>
<th>NON-BASIC Type</th>
<th>DEFAULT Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>(End-Delta-X)</td>
<td>(ANY vdc)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>(End-Delta-Y)</td>
<td>(ANY vdc)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>(Radius)</td>
<td>(ANY vdc)</td>
<td>(NONE)</td>
<td>(N/A)</td>
</tr>
</tbody>
</table>

```c
Circular-Arc-Centre-Close {
  (Centre) BASIC (ANY point)
  (Start-Delta-X) BASIC (ANY vdc)
  (Start-Delta-Y) BASIC (ANY vdc)
  (End-Delta-X) BASIC (ANY vdc)
  (End-Delta-Y) BASIC (ANY vdc)
  (Radius) BASIC (ANY vdc)
  (Close-Type-Flag) BASIC (pie-closure | chord-closure)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

Ellipse {
  (Centre) BASIC (ANY point)
  (NON-BASIC (NONE)
  DEFAULT (N/A))
  (First-Conjugate-Diameter-End-Point)
  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A))
  (Second-Conjugate-Diameter-End-Point)
  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A))
}

Elliptical-Arc {

}
Elliptical-Arc-Close

{Centre
  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{First-Conjugate-Diameter-End-Point
  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{Second-Conjugate-Diameter-End-Point
  BASIC (ANY point)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{Start-Delta-X
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{Start-Delta-Y
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{End-Delta-X
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{End-Delta-Y
  BASIC (ANY vdc)
  NON-BASIC (NONE)
  DEFAULT (N/A)
}

{Close-Type-Flag
  BASIC (pie-closure | chord-closure)
  NON-BASIC (NONE)
}

2-130
Note 1: The basic value for lists of points that can appear in parameters for metafile elements is 1024.

Note 2: The basic value for length of strings in parameters of metafile elements except data records is 256 octets. For data records the basic value for the length of strings is 32767 octets.

Note 3: The complete restricted text string, including appended text, shall be included in a metafile conforming to this agreement. The complete restricted text string shall be scaled isotropically such that the specified aspect ratio for the text is not distorted and the string fits into the text extent parallelogram.

Note 4: The basic value for the number of colour values that can appear in a colour list parameter for the CELL ARRAY element is 1048576. This supports a 1024 x 1024 image.

---

### Attribute-Elements

<table>
<thead>
<tr>
<th>Attribute-Element</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line-Bundle-Index</td>
<td>(ANY index)</td>
<td>(NONE)</td>
<td>(1)</td>
</tr>
<tr>
<td>Line-Type</td>
<td>(solid</td>
<td>dash</td>
<td>dot</td>
</tr>
<tr>
<td>Line-Width</td>
<td>CASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>absolute</td>
<td>BASIC</td>
<td>(ANY POSITIVE vdc)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0.001*max-vdcx)</td>
<td></td>
</tr>
<tr>
<td>scaled</td>
<td>BASIC</td>
<td>(ANY POSITIVE real)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(1.0)</td>
<td></td>
</tr>
<tr>
<td>Line-Colour</td>
<td>CASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>indexed</td>
<td>BASIC</td>
<td>(ANY colour-index)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
<td></td>
</tr>
</tbody>
</table>

2-131
<table>
<thead>
<tr>
<th>Parameter</th>
<th>BASIC</th>
<th>NON-BASIC</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>direct</td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>(foreground)</td>
</tr>
<tr>
<td>Marker-Bundle-Index</td>
<td>(ANY index)</td>
<td>(NONE)</td>
<td>(1)</td>
</tr>
<tr>
<td>Marker-Type</td>
<td>(dot</td>
<td>plus</td>
<td>asterisk</td>
</tr>
<tr>
<td>Marker-Size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASE Marker-Size-Specification-Mode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>absolute</td>
<td>(ANY POSITIVE vdc)</td>
<td>(NONE)</td>
<td>(0.01*max-vdcx)</td>
</tr>
<tr>
<td>scaled</td>
<td>(ANY POSITIVE real)</td>
<td>(NONE)</td>
<td>(1.0)</td>
</tr>
<tr>
<td>Marker-Colour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASE Colour-Specification-Mode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indexed</td>
<td>(ANY colour-index)</td>
<td>(NONE)</td>
<td>(1)</td>
</tr>
<tr>
<td>direct</td>
<td>(ANY colour-direct)</td>
<td>(NONE)</td>
<td>(foreground)</td>
</tr>
<tr>
<td>Text-Bundle-Index</td>
<td>(ANY index)</td>
<td>(NONE)</td>
<td>(1)</td>
</tr>
<tr>
<td>Text-Font-Index</td>
<td>(ANY index)</td>
<td>(NONE)</td>
<td>(1)</td>
</tr>
<tr>
<td>Text-Precision</td>
<td>(string</td>
<td>character</td>
<td>stroke)</td>
</tr>
<tr>
<td>Character-Expansion-Factor</td>
<td>(ANY POSITIVE real)</td>
<td>(NONE)</td>
<td></td>
</tr>
</tbody>
</table>

2-132
<table>
<thead>
<tr>
<th>Character-Spacing</th>
<th>BASIC</th>
<th>(ANY real)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text-Colour</th>
<th>BASIC</th>
<th>(ANY colour-index)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text-Colour</th>
<th>BASIC</th>
<th>(ANY colour-direct)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(foreground)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Height</th>
<th>BASIC</th>
<th>(ANY POSITIVE vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0.01*max-vdcx)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Height</th>
<th>BASIC</th>
<th>(POSITIVE vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(1.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Orientation</th>
<th>BASIC</th>
<th>(ANY vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Orientation</th>
<th>BASIC</th>
<th>(ANY vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Orientation</th>
<th>BASIC</th>
<th>(ANY vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character-Orientation</th>
<th>BASIC</th>
<th>(ANY vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NON-BASIC</td>
<td>(NONE)</td>
</tr>
<tr>
<td></td>
<td>DEFAULT</td>
<td>(0)</td>
</tr>
</tbody>
</table>

| Text-Path               | BASIC     | (right| left| up| down) |
|-------------------------|-----------|---------------------|
|                        | NON-BASIC | (NONE)              |
|                        | DEFAULT   | (right)             |

| Text-Alignment          | BASIC     | (normal| left| center) |
|-------------------------|-----------|---------------------|
|                        | NON-BASIC | (NONE)              |
|                        | DEFAULT   | (right)             |

2-133
right | continuous
NON-BASIC {NONE}
DEFAULT {normal}

{Vertical-Alignment BASIC {normal |
left |
center |
right |
continuous}
NON-BASIC {NONE}
DEFAULT {normal}

{Continuous-Horizontal-Alignment BASIC {ANY real}
NON-BASIC {NONE}
DEFAULT {N/A}}

{Continuous-Vertical-Alignment basic {ANY real}
NON-BASIC {NONE}
DEFAULT {N/A}}

Character-Set-Index BASIC {ANY index}
NON-BASIC {NONE}
DEFAULT {1}

Alternate-Character-Set-Index
BASIC {ANY index}
NON-BASIC {NONE}
DEFAULT {1}

Fill-Bundle-Index BASIC {ANY index}
NON-BASIC {NONE}
DEFAULT {1}

Interior-Style BASIC {hollow |
solid |
pattern |
hatch |
empty}
NON-BASIC {NONE}
DEFAULT {hollow}

Fill-Colour CASE Colour-Specification-Mode
indexed BASIC {ANY colour-index}
NON-BASIC {NONE}
DEFAULT {1}
direct BASIC {ANY colour-direct}
NON-BASIC {NONE}
DEFAULT {foreground}

Hatch-Index BASIC {horizontal |
vertical |

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positive-slope | negative-slope | vertical-hatch | cross-hatch
NON-BASIC    {NONE}
DEFAULT      {horizontal}

Pattern-Index
BASIC        {1..8}
NON-BASIC    {NONE}
DEFAULT      {1}

Edge-Bundle-Index
BASIC        {ANY index}
NON-BASIC    {NONE}
DEFAULT      {1}

Edge-Type
BASIC        {solid | dash | dot | dash-dot | dash-dot-dot}
NON-BASIC    {NONE}
DEFAULT      {solid}

Edge-Width
CASE Line-Width-Specification-Mode
absolute      BASIC        {POSITIVE vdc}
NON-BASIC    {NONE}
DEFAULT      {0.001*max-vdcx}
scaled       BASIC        {POSITIVE real}
NON-BASIC    {NONE}
DEFAULT      {1.0}

Edge-Colour
CASE Colour-Specification-Mode
indexed       BASIC        {ANY colour-index}
NON-BASIC    {NONE}
DEFAULT      {1}
direct       BASIC        {ANY colour-direct}
NON-BASIC    {NONE}
DEFAULT      {foreground}

Edge-Visibility
BASIC        {off | on}
NON-BASIC    {NONE}
DEFAULT      {off}

Fill-Reference-Point
BASIC        {ANY point}
NON-BASIC    {NONE}
DEFAULT      {{0,0}}

Pattern-Table { /* See Note 1 */
(Pattern-Table-Index

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<table>
<thead>
<tr>
<th><strong>BASIC</strong></th>
<th><strong>NON-BASIC</strong></th>
<th><strong>DEFAULT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Number-of-Columns)</td>
<td>BASIC (1..16)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(Number-of-Rows)</td>
<td>BASIC (1..16)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(Local-Colour-Precision)</td>
<td>BASIC (0</td>
<td>1</td>
</tr>
<tr>
<td>(Colour-Array)</td>
<td>indexed BASIC (1..2048*)</td>
<td>ANY colour-index</td>
</tr>
</tbody>
</table>

**Pattern-Size**

<table>
<thead>
<tr>
<th><strong>BASIC</strong></th>
<th><strong>NON-BASIC</strong></th>
<th><strong>DEFAULT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(X-Component-Height-Vector)</td>
<td>BASIC (ANY vdc)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(Y-Component-Height-Vector)</td>
<td>BASIC (ANY vdc)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(X-Component-Width-Vector)</td>
<td>BASIC (ANY vdc)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(Y-Component-Width-Vector)</td>
<td>BASIC (ANY vdc)</td>
<td>NON-BASIC (NONE)</td>
</tr>
</tbody>
</table>

**Colour-Table-Specification**

<table>
<thead>
<tr>
<th><strong>BASIC</strong></th>
<th><strong>NON-BASIC</strong></th>
<th><strong>DEFAULT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Start-Index)</td>
<td>BASIC (1.. Maximum-Colour-Index)</td>
<td>NON-BASIC (NONE)</td>
</tr>
<tr>
<td>(Colour-List)</td>
<td>BASIC (ANY colour-list)</td>
<td>NON-BASIC (NONE)</td>
</tr>
</tbody>
</table>
/* Red */ (255, 0, 0),
/* Green */ (0, 255, 0),
/* Blue */ (0, 0, 255),
/* Yellow */ (255, 255, 0),
/* Magenta*/ (255, 0, 255),
/* Cyan */ (0, 255, 255),
/* Black */ (0, 0, 0),
/* White */ (255, 255, 255))

Aspect-Source-Flags = (SEQUENCE-OF
(ASF-Type BASIC (Line-ASF |
Line-Width-ASF |
Line-Colour-ASF |
Marker-Type-ASF |
Marker-Size-ASF |
Marker-Colour-ASF |
Text-Font-Index-ASF |
Text-Precision-ASF |
Character-Expansion-Factor-ASF |
Character-Spacing-ASF |
Text-Colour-ASF |
Interior-Style-ASF |
Fill-Colour-ASF |
Hatch-Index-ASF |
Pattern-Index-ASF |
Edge-Type-ASF |
Edge-Width-ASF |
Edge-Colour-ASF)
)

Aspect-Source-Flags = (SEQUENCE-OF
(ASF-Type NON-BASIC (NONE))
)

Aspect-Source-Flags = (SEQUENCE-OF
(ASF-Type DEFAULT (Line-ASF, |
Line-Width-ASF, |
Line-Colour-ASF, |
Marker-Type-ASF, |
Marker-Size-ASF, |
Marker-Colour-ASF, |
Text-Font-Index-ASF, |
Text-Precision-ASF, |
Character-Expansion-Factor-ASF, |
Character-Spacing-ASF, |
Text-Colour-ASF, |
Interior-Style-ASF, |
Fill-Colour-ASF, |
Hatch-Index-ASF, |
Pattern-Index-ASF, |
Edge-Type-ASF, |
Edge-Width-ASF, |
Edge-Colour-ASF))

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The PATTERN TABLE element has an unspecified effect when it appears in a picture subsequent to any graphical primitives. The PATTERN TABLE element shall appear prior to any graphical primitive elements to insure that interpreting systems without dynamic pattern update can render the intended effect.

The basic value for the number of colour values in a colour array parameter for the PATTERN TABLE element is 2048. This will support 8 patterns of 16 x 16.

The COLOUR TABLE element has an unspecified effect when it appears in a picture subsequent to any graphical primitives. The COLOUR TABLE element shall appear prior to any graphical primitive elements to insure that interpreting systems without dynamic colour update can render the intended effect.

The basic value for the number of colour values in a colour list parameter for the COLOUR TABLE element is 61. This will support 63 entry colour table.

/*
External-Elements

Message

{Action-Required-Flag

BASIC (no-action)
NON-BASIC (action)
DEFAULT (N/A)

{Message-String

BASIC (ANY string)
NON-BASIC (NONE)
DEFAULT (N/A)

/* See Note 1 */

Application-Data

BASIC (ANY data-record)
NON-BASIC (NONE)
DEFAULT (N/A)

/* See Note 1 */

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Note 1: The basic value for string parameters in metafile elements is 256 octets, except for data records which will support strings with a length up to 32767 octets.
2.2.6 DOCUMENT PROFILE

Presence of Document Constituents

PERMITTED

Generic-Layout-Structure (AS_8613)
Specific-Layout-Structure (AS_8613)
Generic-Logical-Structure (AS_8613)
Specific-Logical-Structure (AS_8613)
Layout-Styles (AS_8613)
Presentation-Styles (AS_8613)
External-Document-Class (AS_8613)
Resource-Document (AS_8613)
Resources (AS_8613)

Document Characteristics

REQUIRED

Document-Application-Profile /* ASN.1 object identifier to be supplied */

Document-Application-Profile-Defaults
{Dimensions (#horizontal(9240)
#vertical(12400))
Medium-Type (10200,13200,'unspecified')
Graphic-Character-Subrepertoire (8)
Raster-Graphics-Type-of-Coding (2 8 3 7 3))

Document-Architecture-Class (AS_8613)
Content-Architecture-Class (AS_8613)
Interchange-Format-Class (A)
ODA-Version /* 1988 */

Non-basic Document Characteristics

PERMITTED

Profile-Character-Sets /* ISO 6937/2 or ISO 8859/1 */
Comments-Character-Sets /* ISO 6937/2 or ISO 8859/1 */
Alternative-Representation-Character-Sets /* ISO 6937/2 or ISO 8859/1 */
Presentation-Features (AS_8613)

Additional Document Characteristics

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PERMITTED

Fonts-List  (AS_8613)
Unit-Scaling  (AS_8613)

Document Management Attributes

REQUIRED

Document-Reference  (AS_8613)

PERMITTED

Title  (AS_8613)
Subject  (AS_8613)
Document-Type  (AS_8613)
Abstract  (AS_8613)
Document-Date-and-Time  (AS_8613)
Creation-Date-and-Time  (AS_8613)
Local-Filing-Date-and-Time  (AS_8613)
Expiry-Date-and-Time  (AS_8613)
Start-Date-and-Time  (AS_8613)
Purge-Date-and-Time  (AS_8613)
Release-Date-and-Time  (AS_8613)
Revision-History  (AS_8613)
Organizations  (AS_8613)
Preparers  (AS_8613)
Owners  (AS_8613)
Authors  (AS_8613)
Copyright  (AS_8613)
Status  (AS_8613)
User-Specific-Codes  (AS_8613)
Distribution-List  (AS_8613)
Additional-Information  (AS_8613)
References-to-Other-Documents  (AS_8613)
Superseded-Documents  (AS_8613)
Keywords  (AS_8613)
Local-File-Reference  (AS_8613)
Document-Size  (AS_8613)
Number-of-Pages  (AS_8613)
Languages  (AS_8613)
Authorization  (AS_8613)
Security-Classification  (AS_8613)
Access-Rights  (AS_8613)
2.2.7 DOCUMENT INTERCHANGE FORMAT

The aspects of this Implementation Agreement that are concerned with the Format of the Interchange of documents are defined in this clause. These aspects include the data stream, the interchange data units, and ASN.1 encodings.

Data Stream

The data stream is in accordance with the Office Document Interchange Format Class A, as 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.

ASN.1 Generation and Parsing

This clause covers two distinct aspects of ASN.1 generation and parsing. The first aspect covers ASN.1 practices that are mandatory for an implementation to be conforming to this Implementors Agreement. The second aspect covers ASN.1 practices that are recommended by this Implementors Agreement. These recommended practices are not mandatory for conformance, but are recommended solely in the spirit of improving interoperability among different implementations.

ASN.1 Generation Requirements

There are no additional requirements, beyond ISO 8824 and ISO 8825, imposed on the ASN.1 generation.

ASN.1 Parsing Requirements

There are no additional requirements, beyond ISO 8824 and ISO 8825, imposed on the ASN.1 parsing.

ASN.1 Generation Recommendations

The focus of the ASN.1 generation recommendations is to generate ASN.1 encodings that will allow parsing by the most rudimentary of implementations. These recommendations are described in the following sub-clauses.

Segmenting Strings

ISO 8825 allows Bit Strings, Octet Strings, and Character Set Strings to be encoded in the Primitive form or in the Constructed form. The choice of which form to use is an option of the encoder. Using the constructed form allows a string to be segmented into a sequence of strings. This sequence of strings is then contained in the constructed form of the string. The
constructed form is allowed the use of the indefinite form on content length.

This Implementors Agreement recommends that implementations limit the encoding to one level of the constructed form for Bit Strings, Octet Strings, and Character Set Strings.

For example, if of type OCTET STRING, the value '432E436F6D6273'H can be encoded in the primitive form as:

Octet
String    Length    Contents
0416 0716    432E436F6D627316

The same value may be encoded in the constructed form as:

Octet
String    Length    Contents
2416 8016

Octet
String    Length    Contents
0416 0216    432E16
0416 0516    436F6D627316
EOC    Length
0016 0016

The same value encoded using two levels of constructed form is not recommended by this Implementors Agreement. An example of an encoding containing two levels of construction is:

Octet
String    Length    Contents
2416 8016

Octet
String    Length    Contents
2416 0416

Octet
String    Length    Contents
0416 0216    432E16
0416 0516    436F6D627316
EOC    Length
0016 0016

Length Expression

ISO 8825 allows the content length of an encoding that could be expressed using the short form to also be expressed using the long form. For example, a length of one could be expressed in the short form as 000000012 or in the long form as 100000012 000000012. CCITT Recommendation X.409 (1984) does not allow the
same liberty in expressing the length of the encoding length. Implementations using these X.409 rules could present interoperability constraints.

This Implementors Agreement recommends that implementations generate content lengths only in their most economical form.

Ordering of Set Members

ISO 8824 defines sets to be unordered lists of values. It is the generator's option to select an order for the values of the set. Since this ordering is unpredictable from one implementation to the next, it is recommended that generators order the values in a set according to the order in which the members appear in the definition of the set. The intent of this recommendation is to reduce the possible interoperability problems associated with the unpredictable ordering of members in a set.

ASN.1 Parsing Recommendations

The overall intent of these parsing recommendations is to allow a high tolerance in the representation of the ASN.1 syntax without jeopardizing the semantics of the information being conveyed. Each of these tolerances is described in a following sub-clause.

Segmented Strings

The ASN.1 generation restriction on segmenting strings is a recommendation of this Implementors Agreement and is not a requirement of ISO 8825. Therefore, it is recommended that implementations accept string encodings which have been segmented into more than one level of the constructed form.
2.2.8  Relationship to Other DAPS

EWOS

There are three Document Application Profiles (DAPs) being defined by the European Workshop on Open Systems (EWOS) ODA Expert Group. These are called Q/111, Q/112, and Q/113.

Q/113 is expected to be equivalent to the NBS DAP.

CCITT

There are three DAPs defined by CCITT:

* T.501 - Document Application Profile MM for the Interchange of Formatted Mixed Mode Documents,

* T.502 - Document Application Profile PM1 for the Interchange of Processable Form Documents, and

* T.503 - Document Application Profile for the Interchange of Group 4 Facsimile Documents.

It is intended that the NBS DAP will be compatible with the CCITT T.502 DAP.

TOP

The NBS DAP will be presented to the Technical and Office Protocol (TOP) Group as a suggested replacement for the TOP Version 3.0 ODA Application Profile.

The content information of a Geometric Content Architecture content portion description defined according to this NBS DAP conforms to the GGM section of the TOP Version 3.0 Recommendation, without any ESCAPE elements and Grouped Drawing Primitives.

INTAP

The Interoperability Technology Association for Information Processing (INTAP) Experts Group on ODA/ODIF is developing two sets of profiles, AE.111n-J and AE.112n-J of small and medium complexity, respectively. The AE.111n-J set includes the AE.1111-J, AE.1114-J, AE.1115-J, and AE.1116-J profiles. The AE.112n-J set includes the AE.1121-J, AE.1124-J, AE.1125-J, and AE.1126-J profiles. AE.1126-J is expected to be a functional equivalent to the NBS DAP.
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Ongoing Implementation Agreements for Open Systems Interconnection Protocols
Volume 1:
Stable Virtual Terminal & Document Architecture and Interchange Format

Robert Rosenthal, Editor

This document records current agreements on implementation details of Open Systems Interconnection Protocols among the organizations participating in the NBS/OSI Workshop Series for Implementors of OSI Protocols. These decisions are documented to facilitate organizations in their understanding of the status of agreements. This is a standing document that is updated after each workshop (about 4 times a year).

local area networks; NBS/OSI Workshop; network protocols; Open Systems Interconnection; OSINET; testing protocols

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