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ONGOING IMPLEMENTATION AGREEMENTS for Open Systems Interconnection Protocols

NBS Workshop
for Implementors of
Open Systems Interconnection

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ONGOING IMPLEMENTATION AGREEMENTS

Based on the Proceedings of the
NBS Workshop for Implementor's of OSI
Plenary Assembly Held October 9, 1987
National Bureau of Standards
Gaithersburg, Maryland 20899

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1. GENERAL INFORMATION

1.1 PURPOSE OF THIS DOCUMENT

This document records ongoing implementation specification agreements of OSI protocols among the organizations participating in the NBS/OSI Workshop Series for Implementors of OSI Protocols. This work is not considered advanced enough for use in product development or procurement reference.

The companion document, "Stable Implementation Agreements for Open Systems Interconnection Protocols," records mature agreements considered advanced enough for use in product development or procurement reference.

As each protocol specification is completed, it is moved from this ongoing document to the stable companion document.

1.2 PURPOSE OF THE WORKSHOP

At the request of industry, the National Bureau of Standards organized the NBS Workshop for Implementors of OSI to bring together future users and potential suppliers of OSI protocols. The Workshop accepts as input the specifications of emerging standards for protocols and produces as output agreements on the implementation and testing particulars of these protocols. This process is expected to expedite the development of OSI protocols and promote interoperability of independently manufactured data communications equipment.

1.3 USE AND ENDORSEMENT BY OTHER ENTERPRISES

The Workshops are held for those organizations expressing an interest in implementing or procuring OSI protocols and open systems. However, there is no corporate commitment to implementations associated with workshop participation.

The agreements contained in earlier versions of this document were used for OSI demonstrations at the National Computer Conference in 1984 and at the AUTOFACT conference in 1985.

The agreements from several versions of this document have been adopted for use in implementations running on OSINET.

The MAP/TOP Steering Committee has endorsed these agreements and will "continue the use of the most current, applicable Implementors Workshop Agreements in all releases of the MAP and TOP specifications."

The COS Strategy Forum has "adopted a resolution stating that as a matter of policy COS should select as its sources of Implementation Agreements organizations or forums that are: (1) Broadly open, widely

recognized OSI workshops (NBS/OSI Workshops are first preference) ..."

The U.S. Government OSI User's Committee is using the implementation specifications from the "Stable Implementation Agreements for Open System Interconnection Protocols" in its Federal procurement specification, "Government OSI Profile (GOSIP)."

1.4 RELATIONSHIP OF THE WORKSHOP TO THE NBS LABORATORIES

As resources permit, NBS, with voluntary assistance from industry, develops formal protocol specifications, reference implementations, tests and test systems for the protocols agreed to in the workshops. This is work made available to the industry volunteers and to others making valid commitments to organized events and activities such as NCC, AUTOFACT, and OSINET. As soon as this work can be adequately documented, it is placed in the public domain through submission to the National Technical Information Service. Any organization may then obtain the work at nominal charge.

The NBS laboratories bear no other relationship to the workshop.

1.5 STRUCTURE AND OPERATION OF THE WORKSHOP

1.5.1 Plenary

The main body of the workshop is a plenary assembly. Any organization may participate. Representation is international. NBS prefers for the business of workshops to be conducted informally, since there are no corresponding formal commitments within the workshop by participants to implement the decisions reached. The guidelines we follow are: 1) one vote per company or independent division, 2) only companies that regularly attend should vote, 3) only companies that plan to sell or buy a protocol should vote on its implementation decisions, 4) only companies knowledgeable of the issues should vote, and 5) no proxy votes are admissible.

1.5.2 Special Interest Groups

Within the workshop there are Special Interest Groups (SIGs). The SIGs receive their instructions for their technical program of work from the plenary. The SIGs meet independently, usually during the workshop. As technical work is completed by a SIG, it is presented to the plenary for disposition. Companies participating in a SIG are expected to participate in the plenary. Voting rules for SIGS are the same as voting rules for the plenary.

Special Interest Groups sometimes correspond with organizations performing related work, such as ANSI committees. Such correspondence should be sent through the plenary to the parent

committee, such as ANSC X3T5 or ANSC X3S3. When SIG meetings take place between workshops, the correspondence from these meetings should be addressed directly to the parent committee and copied to the workshop plenary.

Following are procedures for cooperative work among Special Interest Groups.

- Any SIG (SIG 1) or individual having issues to discuss with or requirements of another SIG (SIG 2) should bring the matter to the attention of the chairperson of that SIG (SIG 2).
- The SIG 2 chairperson should bring the matter before SIG 2 for action.
- SIG 2 should respond to the concerns or needs of SIG 1 or the individual in a timely manner.
- If the matter cannot be satisfactorily resolved or if the request is outside the charter assigned to SIG 1, then it should be brought before the plenary.
- SIGs are expected to complete work in a timely manner and bring the results before the plenary for disposition. However, the plenary may elect to act on any issue within the scope of the workshop at any time.

Following are the charters of the ten Special Interest Groups.

FTAM SIG

Develop Phase 2 product-level specifications.

Future new work items will be defined in a Phase 3 specification. It will contain only extensions of Phase 2 FTAM. It is a goal that Phase 3 will be backward compatible with Phase 2 FTAM. The set of future work items listed below may be changed by the plenary if the work is more appropriate for other SIGs.

High priority work items:

- Clean up section 6 of this document
- Specify Reliable File Service
- Specify Recovery and Restart Data Transfer functional units in the user correctable file service
- Specify concurrency control parameter.

Low priority work items:

- o Add new document types/constraint sets
- o Define subset of authorization requirements
- o Specify Presentation Context Management functional unit.

X.400 SIG

Develop product-level specifications for Message Handling Systems using the CCITT X.400 Recommendations.

Develop abstract tests for X.400, as requested by the ad hoc rapporteur for this study question in CCITT. This work is to be submitted by the plenary (after its approval) to the U.S. Department of State as a proposed U.S. contribution to CCITT Study Group VII.

Lower Layer SIG

The Lower Layer SIG will study OSI layers 1-4 and produce recommendations for implementations to support the projects undertaken by the workshop and the work of the other SIGs. Both connectionless and connection-oriented modes of operation will be studied. The SIG will accept direction from the plenary for work undertaken and the priority which it is assigned.

The objectives of the Lower Layer SIG are:

- o Study OSI layers 1-4 as directed by the plenary,
- o Produce and maintain recommendations for implementation of these layers,
- o Where necessary, provide input to the relevant standards bodies concerning layers 1-4, in the proper manner, and
- o Begin work on the implementation specification of the ISO Network Layer Routing Exchange Protocol prior to the ISO draft achieving DIS status.

The Lower Layer SIG will study both existing and emerging ISDN standards pertaining to user access and user services. The SIG will:

- o Develop implementation agreements for user-network interfaces
- o Develop conformance requirements
- o Liaise with other standards/interest groups

Performance SIG

The plenary will provide the following inputs to the OSI Performance SIG:

- o the set of applications for which the performance of OSI protocols is of particular concern,

- o the requirements for each application including:

  - performance targets
  - network topology
  - background network loads
  - application traffic characteristics, and

- o the final and ongoing, "Implementation Agreements Among Implementors of OSI Protocols".

The objectives of the OSI Performance SIG are to:

- o determine whether the OSI protocols are able to meet these performance requirements,

- o report these determinations to the plenary, and where appropriate, provide input to the voluntary standards bodies concerning changes to existing standards and the requirements for new ones, in the appropriate form.

OSI Security Architecture SIG

GOAL: To develop an overall OSI Security Architecture which is consistent with the OSI reference model and which economically satisfies the primary security needs of both the commercial and Government sectors.

APPROACH: To define a security architecture encompassing the security addenda presently being specified at certain OSI layers, the required cryptographic algorithms and related key management functions, and the security management functions which must be performed between the layers and the peer entities defined in the OSI architecture.

Directory Services SIG

Produce functional implementation agreements based on ISO/CCITT specifications for Directory Services in accordance with the objectives and goals of the plenary.

- o Provide a subset for NBS publication which is functional and forward compatible to further work by this Special Interest Group.

- o Define stable core functionality which can be implemented in the near term.

Virtual Terminal SIG

This Special Interest Group's charter is based upon the implementation of Draft International Standards 9040 and 9041 and their respective addenda, in providing Basic Virtual Terminal Service.

This group will develop agreements for the implementation and testing of the following terminal types.

- X.29 PAD
- TELNET
- Basic Scrolling
- Basic Paging
- Basic Forms

Upper Layers SIG

The charter of the Upper Layers SIG is as follows.

- Develop product level specifications for the implementation of:
  - Session service and protocol,
  - Presentation service and protocol,
  - ACSE service and protocol.

- In addition, the specifications to be developed by the Upper Layers SIG will address issues that are common to layers 5-7 such as addressing, registration, etc. This SIG will review output and proposals from other SIGs to ensure consistency with international standards regarding Upper Layer Architecture.

- The specifications developed will be done to support the requirements of FTAM, X.400, VT, Directory Services and any other SIG.

The objectives of the Upper Layers SIG are to:

- Study OSI layers Session, Presentation, and ACSE,

- Incorporate implementor's agreements in the 1987 NBS standing document,

- Produce and maintain recommendations for implementations of these layers,

- Where necessary provide input to the relevant standards bodies concerning layers Session, Presentation, and ACSE,

- React in a timely manner (i.e., to develop corresponding implementor's agreements) to technical changes in ISO documents.

The following are the guidelines under which the Upper Layers SIG will operate:

- o Align implementation agreements with other organizations such as ANSI and ISO,

- o Develop implementor's agreements that promote the efficiency of protocols,

- o Develop implementor's agreements that promote ease in the verification of interoperability,

- o Develop necessary conformance statements.

Network Management SIG

Will use phased workload approach to accommodate volume of emerging OSI management-related standards,

The SIG will:

- o Agree upon NBS Implementors OSI systems management reference model

- o Develop product level specifications for implementations, relating to common services/protocols for exchanging management information between OSI nodes

- o Develop product level specifications for implementations relating to specific management services for exchanging fault management (FM), Security Management (SM), Configuration Management (CM), Accounting Management (AM), and Performance Management (PM) information between OSI nodes

- o Initiate and coordinate with appropriate layer SIGs product level specifications of layer-specific management information to support FM, SM, CM, AM, and PM.

As necessary, the SIG will:

- o Establish liaisons with various standards bodies

- o Provide feedback for additional/enhanced services and protocols for OSI management

Office Document Architecture and Office Document Interchange Format SIG

The SIG will:

- o develop one or more product level specifications for implementations of ISO/DIS 8613, i.e., the SIG will define one or more Document Application Profiles (DAP's)

- develop requirements for conformance testing of products purporting conformance to the (se) DAP (s)

- specify and describe requirements for services that manage the generation and interpretation of the ODA/ODIF document representation

- determine preferred relationships between ODA/ODIF and other document interchange formats

- promote the SIG's agreements (e.g., presentations, product demonstrations, press releases)

As necessary, the SIG will:

- establish liaison with required SIG's (e.g., X.400, FTAM, and Upper Layers SIG's) to seek efficient transfer capability for document interchange based on the ODA/IDIF SIG agreements

- provide feedback and liaison to groups working on ISO/DIS 8613 related activities

1.6 POINTS OF CONTACT

OSI Workshop - Chairman	Rob Rosenthal, NBS, 301/975-3603
OSI Workshop - Registration	Larry Keys, NBS, 301/975-3604
FTAM SIG	Klaus Truoel, GMD/DFN, 49-615-1 869312
X.400 SIG	John Stidd, Xerox, 408/737-4338
Lower Layers SIG	Mike Gering, IBM, 919/543-0481
Performance SIG	
Security SIG	Denny Branstad, NBS, 301/975-2913
DS SIG	J. J. Cinecoe, WANG, 617/967-5514
VT SIG	Rick Wilder MITRE, 703/883-6174
Upper Layers SIG	Mike Ellis, HP, 916/786-8000x4292
ODA/ODIF SIG	Frank Dawson, IBM, 214/556-5073
Network Management	Paul Brusil, MITRE, 617/271-7632
MAP	Gary Workman, GM, 313/947-0599
TOP	Laurie Bride, BCS, 206/763-5719
Government OSI Profile	Jerry Mulvenna, NBS, 301/975-3631
OSINET	
Steering Committee	Jerry Mulvenna, NBS, 301/975-3631
Technical Committee	Ed Strum, IBM, 415/855-4697
SME (MAP/TOP Sponsorship)	Mark Shaw, 313/271-1500
U.S. Government OSI User's Committee	Jerry Mulvenna, NBS, 301/975-3631

2. NETWORK LAYER

2.6 CONNECTION-MODE NETWORK SERVICE (CONS)

- CONS may be provided as part of the subnetwork types mentioned in section 2. In particular, when CONS is provided in a Local Area Network, ISO/DIS 8881, in addition to the documents listed above, shall apply.

3. TRANSPORT

3.7 CONNECTIONLESS TRANSPORT

Document ISO IS 8072/DAD1 is the Transport Service Definition covering Connectionless-mode Transmission. Document ISO DIS 8602 is the Protocol for providing the Connectionless-mode Transport service.

4. PHASE 3 FTAM IMPLEMENTATION SPECIFICATION

4.1 INTRODUCTION

Will be included in Phase 3:

- o specify error control procedures
- o specify Recovery and Restart Data Transfer functional units
- o specify concurrency control parameters
- o specify the use of directory services
- o specify implementation of character set ISO 6937

May be included in Phase 3:

- o new document types/constraint sets
- o define the use of Access Control
- o specify the use of Presentation Context Management functional unit
- o specify implementation of Filestore Management
- o define filename convention
- o specify overlapped access

4.2 SCOPE AND FIELD OF APPLICATION

Phase 3 FTAM implicitly includes all of the implementation agreements and conformance requirements of Phase 2 FTAM. The Phase 3 FTAM specification will only specify extensions to Phase 2 FTAM and implementations of Phase 3 FTAM are expected to also implement Phase 2 FTAM.

Phase 3 FTAM will include at least the following:

- o Specification of Error Control Procedures
- o Specification of Recovery and Restart Data Transfer functional units
- o Specification of concurrency control parameters
- o Use of character set ISO 6937
- o Specification of the use of directory services

4.3 STATUS

The Phase 3 FTAM specification has been accepted as the basis for further work on this specification. It has been given only preliminary review by the FTAM SIG. It is subject to much change in all sections at future meetings. This specification is expected to be completed by December 1988.

4.4 ERRATA

4.5 ASSUMPTIONS

1. Implementations will be based on the ISO 8571 DIS version of FTAM. When the IS text is approved following the close of the DIS ballot the agreements will be modified as necessary to meet the IS specifications.
2. The following documents are required for reference:

    - o ISO 8571 Parts 1-4 FTAM
    - o ISO 8649, ISO 8650 ACSE
    - o ISO 8822, ISO 8823 Presentation
    - o ISO 8326, ISO 8327 Session
    - o ISO 6937 character set
    - o ISO 8571 PDAD1 - Filestore Management

4.6 FILESTORE AGREEMENTS

4.7 SERVICE AGREEMENTS

4.7.1 FTAM Service Level Agreements

Implementation of both the User Correctable File Service (UCFS) and the Reliable File Service (RFS) is defined. Implementation of the UCFS implies the ability to negotiate for the use of the Recovery and/or the Restart Data Transfer functional units. Implementation of the RFS implies implementation of the File Error Recovery Protocol Machine (FERPM) as specified in Annex A of the Part 4 FTAM standard.

4.7.2 Service Class Agreements

Implementation of a service class is defined as the ability to negotiate for the use of the service class in any service level negotiated, and the ability to provide the services of the service class in an ISO conformant way.

There are no service classes specified in addition to those specified in Section 4.2.4.

4.7.3 Functional Unit Agreements

Implementation of a functional unit is defined as the ability to negotiate for the use of the functional unit in any service level and service class where the use of that functional unit is allowed, and the ability to provide the services of the functional unit in an ISO conformant way.

Implementation of the following functional units is defined.

- o Recovery
- o Restart Data Transfer

4.7.4 Error Recovery

1. When a class I, II or III error occurs, the docket will always be present as long as the association is not terminated. Recovery from a class I, II or III error is defined as long as the association is not terminated. Once the association is terminated, recovery from a class I, II or III error is not possible.

2. When a class IV error occurs, the length of time the docket is maintained is determined by the local system. Recovery from a class IV error is only possible as long as both end systems maintain the docket.

3. If the RFS has been selected, the number of times the error recovery entity will try to recover from an error is an implementation option.

4. If an error occurs when the RFS has been selected, the error recovery entity will wait at least the amount of time specified by the "suggested delay" field of the diagnostic parameter before attempting to recover. If "suggested delay" time is not specified, the default delay time is an implementation option.

4.7.5 Concurrency

Concurrency controls required for the access to a file may be specified by the initiating service user.If, when the request (select, create or open) is received by the filestore there is currently no other user of the file, the concurrency controls requested will be applied (local filestore considerations may limit the controls which may be accepted).

If, when the request (select, create or open) is received by the filestore there is currently at least one other user of the file, the concurrency controls requested will be checked for violation of the concurrency controls currently applied to the file by each current file accessor for each action. If the controls requested do not violate the controls currently in place, the controls requested will be applied to the regime being established.

The following table defines compatibility of requested oncurrency controls with controls already in use.

Table 4.1 Concurrency negotiation rules

control request / control currently applied	not required	shared	exclusive	no access
not required	A	A	A	A
shared	A	A	N	N
exclusive	A	N	N	N
no access	A	N	N	N

Key: A - accepted
N - send negative response

Note: Concurrency controls must be maintained individually for each file accessor.

If the concurrency controls requested by the initiating service user are not acceptable to the responding service user due to local filestore considerations, or due to violation of

concurrency controls already imposed by other users, the request must be rejected.

If no requested concurrency controls are specified by the initiating service user the following defaults will be applied.

action	control
read	shared
insert	exclusive
replace	exclusive
extend	exclusive
read attrib	shared
change attrib	exclusive
delete file	exclusive

Note: Use of the concurrency control parameter requires the successful negotiation of the availability of storage group of file attributes.

4.8 PROTOCOL AGREEMENTS

4.9 CONFORMANCE

In addition to the specific conformance requirements specified in the following subsections, conformance to this specification requires:

- conformance to ISO 8571
- conformance to Phase 2 FTAM specified in Section 10.2.

4.9.1 Initiators

Every implementations of an FTAM initiator shall support:

1. the Recovery protocol and its mandatory parameters with minimum ranges,
2. the Restart Data Transfer protocol and its mandatory parameters with minimum ranges,
3. the use of the concurrency control parameter on the F-SELECT, F-CREATE, and F-OPEN,

and support the applicable procedures, defined in ISO 8571/4 Clauses 8.13, 15.3, 16.3 and 17.3. To support the above protocols and procedures the implementation shall be able to:

1. request the use of either the UCFS or the RFS,
2. request the use of either Recovery functional unit, Restart Data Transfer functional unit of both when UCFS has been selected,

3. request the storage group of file attributes with the "attribute groups" parameter.

4.9.2 Responders

Every implementation of an FTAM responder shall support:

1. the Recovery protocol and its mandatory parameters with minimum ranges,
2. the Restart Data Transfer protocol and its mandatory parameters with minimum ranges,
3. the use of the concurrency control parameter on the F-SELECT, F-CREATE, and F-OPEN,

and support the applicable procedures, defined in ISO 8571/4 Clauses 9.13, 15.3, 16.3 and 17.3. To support the above protocols and procedures the implementation shall be able to:

1. accept requests for the use of either the UCFS or the RFS,
2. accept requests for the use of either the Recovery functional unit, Restart Data Transfer functional unit or both when UCFS has been selected,
3. accept requests for the storage group of file attributes with the "attribute groups" parameter.

4.9.3 Error Recovery Procedures

Every implementation of either an initiator or responder shall support the File Error Recovery Protocol Machine and support the procedures, defined in ISO 8571/4 Clauses 18 and 19. To support the above procedures an implementation shall:

1. maintain the docket after a class IV error for at least 1 hour after the occurrence of the error,
2. when the RFS has been selected, attempt recovery from each error at least once,
3. when the RFS has been selected, support a default delay time before attempting recovery of 1 minute.

5. CCITT 1988 X.400 BASED MESSAGE HANDLING SYSTEM

5.1 INTRODUCTION

This is an implementation agreement developed by the Implementor's Workshop sponsored by the U.S. National Bureau of Standards to promote the useful exchange of data between devices manufactured by different vendors. This agreement is based on, and employs protocols developed in accord with, the OSI Reference Model. While this agreement introduces no new protocols, it eliminates ambiguities in interpretations.

This is an implementation agreement for a Message Handling System (MHS) based on the X.400-series of Recommendations (1988).

5.2 SCOPE

This agreement applies to Private Management Domains (PRMDs) and Administration Management Domains (ADMDs). Four boundary interfaces are specified:

(A) PRMD to PRMD;
(B) PRMD to ADMD;
(C) ADMD to ADMD.
(D) MTA to MTA (within a PRMD, e.g., for MTAs from different vendors.)

In case A, the PRMDs do not make use of MHS services provided by an ADMD. In cases B and C, UAs associated with an ADMD can be the source or destination for messages. Furthermore, in cases A and B, a PRMD can serve as a relay between MDs, and in cases B and C an ADMD can serve as a relay between MDs. Figure 5-1 illustrates the interfaces to which the agreement applies.

X.400 protocols other than the Message Transfer Protocol (P1) and the Interpersonal Messaging Protocol (P2) are beyond the scope of this agreement. Issues arising from the use of other protocols or relating to P1 components in support of other protocols are outside the scope of this document. This agreement describes the minimum level of services provided at each interface shown in Figure 5-1. Provision for the use of the remaining services defined in the X.400 Series of Recommendations is outside the scope of this document.

With the exception of intra domain connections, this agreement does not cover message exchange between communicating entities within a domain even if these entities communicate via P1 or P2. Bilateral agreements between domains may be implemented in addition to the requirements stated in this document. Conformance to this agreement requires the ability to exchange messages without use of bilateral agreements.

PRMD = Private Management Domain
ADMD = Administration Management Domain

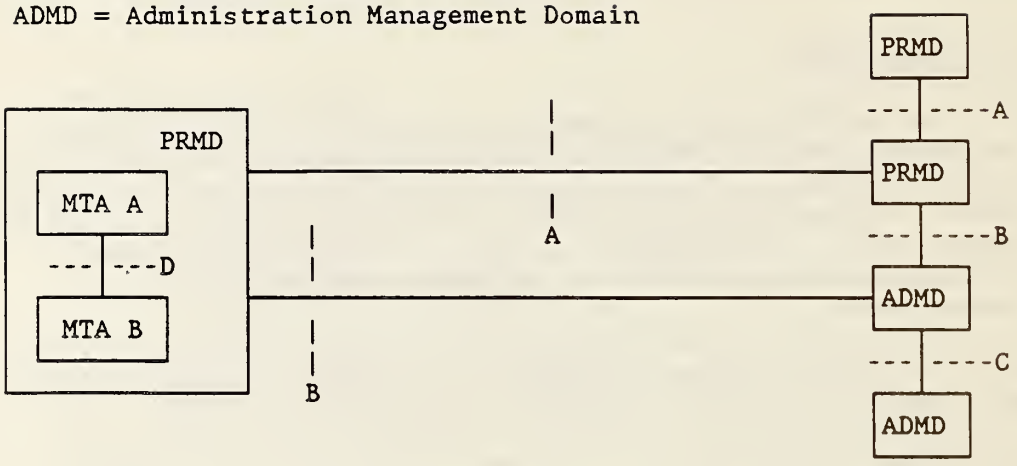

Figure 5.1 This agreement applies to the interface between: (A) PRMD and PRMD; (B) PRMD and ADMD; (C) ADMD and ADMD; and (D) MTA and MTA

5.3 STATUS

This version of the X.400 based Message Handling System implementation agreements is under development.

5.4 ERRATA

5.5 PRMD to PRMD

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5.5.2 Service Elements and Optional User Facilities

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5.7.4 Service Elements and Optional User Facilities

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5.7.5.2 P1 Protocol Elements

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6. ISO VIRTUAL TERMINAL PROTOCOL

6.1 INTRODUCTION

The NBS/OSI Workshop Virtual Terminal (VT) SIG is making implementation agreements for the OSI Basic Class VT Service and Protocol, 2nd ISO/DIS 9040 and 9041, including the first addenda to both 9040 and 9041, subject to these addenda reaching a stable state (i.e., DAD) by the implementation agreement capability freeze date.

These implementation agreements fall into the following categories.

- Functionality to be implemented, i.e., subsets, etc..
- Identification and specification of VT profiles to be supported by conforming implementations.
- Agreements with regard to implementation issues not specified in 2nd ISO/DIS 9040 and 9041 and their addenda.
- Resolution of problems with 2nd ISO 9040 and 9041 identified during implementation.
- Statement of requirements to meet conformance to these agreements.

These implementation agreements will be aligned with any changes made in progressing 2nd ISO 9040 and 9041 and their addenda from DIS to IS.

6.2 SCOPE AND FIELD OF APPLICATION

To be determined.

6.3 STATUS

The NBS workshops Virtual Terminal Implementation Agreements are being done in two phases. The items below provide the status of each phase.

1) Phase Ia Virtual Terminal Agreements were completed in July 1987. The Phase Ia Agreements are based on 2nd ISO/DIS 9040 and 9041 and include the profile for TELNET operation.

2) Phase Ib Virtual Terminal Agreements will be completed in early 1988. The Phase Ib Agreements are based on 2nd ISO/DIS 9040 and 9041 and their Addenda. Phase Ib will add profiles for X.3 PAD, TRANSPARENT and SCROLL FORMS and PAGE operation to those available from Phase Ia.

3) The Phase II agreements will be completed at an unspecified future date, and will be based on IS Virtual Terminal documents.

4) It is intended that Phase II agreements be compatible with Phase I agreements, provided no changes are made to the Standards (in progressing from DIS to IS) to make this goal impossible.

5) The Phase I Agreements assume that the changes to the mapping of Protocol Elements in 2nd ISO/DIS 9041, as suggested by ANSI, will be accepted.

6.4 ERRATA

6.5 SERVICES

6.5.1 Services Provided

6.5.1.1 Basic Class Service Subsets

The VT-A and VT-B service subsets as described in 2nd ISO/DIS 9040 have been selected. The VT-C subset will not be used. The following service facilities provided in subsets A and B have been selected.

- o Association Establishment
- o Association Termination
- o Switch Profile Negotiation
- o Data Transfer
- o Delivery Control - Simple Delivery control only has been selected. Quarantine delivery control will not be used.
- o Access Right Management
- o Destructive Break Facility

6.5.1.2 Extended Facility Set

The extended service facility set, as described in the first addendum to 2nd ISO/DIS 9040, has been selected.

6.5.1.3 Modes of Operation

Both Asynchronous and Synchronous modes of operation have been selected.

6.5.1.4 Access Rights

All types of Access Right mechanisms, as specified in 2nd ISO/DIS 9040 and its addendum, will be supported.

6.5.2 Service Profiles

The two Default Virtual Terminal Profiles, one for each mode of operation, as specified in 2nd ISO/DIS 9040 will be supported. Additionally, the following profiles have been selected.

- TELNET
- PAGE
- CCITT X.3 PAD Compatible Operation
- TRANSPARENT
- FORMS
- SCROLL

6.6 PROTOCOL

6.6.1 Protocol Elements

All Protocol Elements supported by the VT-B subset have been selected.

6.6.2 Mapping of Protocol Elements

Mapping of protocol elements on to underlying ACSE or Presentation Services is as defined in 2nd ISO/DIS 9041.

6.6.3 Protocol Data Unit Structure

Protocol data unit structure is as defined in 2nd ISO/DIS 9041.

6.7 CONFORMANCE

Support the 9041 Clause 13 conformance requirements (with the exception of the default profile) plus the additional conformance requirements identified below. Due to the potential changes in the VT standards, implementation of the default profile is not required for conformance. This implies that a profile name must be specified on the VT-ASSOCIATE.

A mode must be supported.

- The TELNET profile must be supported.
- Support VTE parameter ranges or values specified in the above NBS agreed profile and associated notes.
- Support the destructive VT-BREAK functional unit.

6.8 TEST REQUIREMENTS

To be determined.

6.9 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 as the value of x-window for both display objects. This argument is mandatory and takes a nonnegative integer value.

2. Which is used to designate the character repertoire(s) available for both objects as value(s) for repertoire-assignment; multiple occurrences are permissible and will imply a non-default value for repertoire-capability. This argument is optional; if not present a single repertoire is invoked and is the full US 7-bit ASCII set.

3. Which is used to indicate whether the TELNET GO-AHEAD (GA) facility will be used. This is special profile argument Pp-1 with numeric identifier value 1 and type BOOLEAN. Value "true" requires use of GA, value "false" forbids it. Control object GA is not required if value is "false." This argument is optional and defaults to "false."

The profile is defined as follows:

```
Display-objects =
{
        {    display-object-name =D,*(DISPLAY)*
             object-access-right = WACA,*(the association is initiated by
                                          the "terminal" VT-USER  )*
             dimensions = 2
                       x-dimension =
                       {

                            x-bound = "unbounded",
                            x-addressing = "no constraint",
                            x-absolute = "not permitted",
                            x-window = r1
                            *(all other values assume default values)*
                       },
                       y-dimension =

                       {
                            y-bound = "unbounded",
                            y-addressing = "higher only",
                            y-absolute = "not permitted",
                            y-window = 0
                            *(all other values assume default values)*
                  },
             repertoire-assignment = r2
        },
        {
             display-object-name = K, *(KEYBOARD)*
             object-access-right = WACI,
                  x-dimensions = 2,
                       x-dimension =
                       {
                            x-bound = "unbounded",
                            x-addressing = "no constraint",
                            x-absolute = "not permitted",
                            *(all other values assume default values)*
                            x-window = r1
                       },
                       y-dimension =
                       {
                            y-bound = "unbounded",
                            y-addressing = "higher only",
                            y-absolute = "not permitted",
                            y-window = 0
                            *(all other values assume default values)*
                       },
             repertoire-assignment = r2
        }
},
Control-object =
```

```
{
        {

             CO-name = SY,*(SYNCHRONIZE)*
             CO-access = "not-subject-to-access-control",
             CO-category = boolean,
             CO-size = 2,
             CO-priority = "urgent"
             CO-trigger = "selected",
        },

        {
             CO-name = DI, *(DISPLAY-SIGNAL)*
             CO-access = WACA,
             CO-category = boolean,
             CO-size = 3,
             CO-priority = "urgent"
             CO-trigger = "selected"
        }

        {
             CO-name = KB, *(KEYBOARD-SIGNAL)
             CO-access = WACI,
             CO-category = boolean,
             CO-size = 3
             CO-priority = "urgent"
             CO-trigger = "selected",
        }

        {
             CO-name = EI, *(echo control object for initiator)*
             CO-access = WACI,
             CO-category = boolean,
             CO-size = 2,
             CO-priority = "normal",
             CO-trigger = "selected"
        }

        {
             CO-name = EA, *(echo control object for acceptor)*
             CO-access = WACA,
             CO-category = boolean,
             CO-size = 2,
             CO-priority = "normal"
             CO-trigger = selected,
        }
        if r3 = "true"
        {
             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-objects =
{
        {
            device-name = DISPLAY-DEVICE,
            device-display-object = D,
            device-default-CO-initial-value = "true" *(initially "on")*
            device-minimum-X-array-length = 1, *(no constraint)*
            device-minimum-Y-array-length = 1, *(no constraint)*
            device-control-object = {SY, DI}, *(SYNC, DISPLAY-SIGNAL)*
            device-termination-event-list = NULL,
            device-default-CO-access = WACA
            *(other device parameters assume default values or
                are not required)*
        },

        {
            device-name = KEYBOARD-DEVICE,
            device-display-object = K,
            device-default-CO-access = WACI,
            device-default-CO-initial-value = "true", *(initially "on")*
            device-minimum-X-array-length = 1, *(no constraint)*
            device-minimum-Y-array-length = 1, *(no constraint)*
            device-control-object = {SY,KB}, *(SYNC, KEYBOARD-SIGNAL)*
            device-termination-event-list = NULL,
                *( other device parameters assume default values or
                    are not required )*
        }
}

type-of-delivery-control = simple-delivery-control.
```

Notes:

1. This profile can be used only in A mode.

2. Control object updates are used in this profile to perform functions equivalent to certain TELNET commands as follows:

Control Object	BOOLEAN	TELNET Command
GA	1	GA (go ahead)
SY	1	IP/SYNC (interrupt process,sync)
DI/KB	1	IP (interrupt process)
SY	2	AO/SYNC (abort output, sync)
DI/KB	2	AO (abort output)
DI/KB	3	AYT (are you there)

These control object updates should be made by toggling the current value of the bit corresponding to the command to be

performed.

The TELNET EC (erase character) command should be mapped to a pointer relative (x:= x-1) update and a 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. User of this profile should refer to the TELNET specification (MIL-STD-1782) and RFC's 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.

3. An attribute update is used to switch in and out of the "binary" character set. This is not quite equivalent to the TELNET BINARY option because the new character set is unilaterally asserted for the display object rather than changed by a bilateral negotiation.

4. The EI and EA control objects are used to emulate TELNET's echo and GO-AHEAD negotiation. The first boolean of each control objects is used to negotiate whether the initiator (terminal) side will echo characters to the local terminal. Because the initial value of these control objects is "false" and TELNET starts with local echo negotiated, "false" indicates local echo. Updating one control object is interpreted as a request to start remote echo ("true") or resume local echo ("false"). The peer VT-USER should then update the other control object to the same value to accept the requested change or to the opposite value to reject it. The second boolean of the EI and EA control objects is used to negotiate the use of GO-AHEAD in a similar manner. The initial value of "false" indicates that GO-AHEAD will be used. The negotiation of a "true" value means that suppression of GO-AHEAD is in effect.

5. 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 BT-deliver request. With remote echo a timeout or buffer length may be used to trigger a VT-deliver request. This buffer length may be 1.

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

7. Option negotiation in TELNET can take place at any time during a session and modifies option settings one at a time. As subset C of VTP is not required by the NBS/OSI Implementor's Agreements, negotiation of TELNET options other than echo and character set is not supported by this profile.

8. In addition to constraints presented by VTE 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.

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

10. The designations "binary", "7-bit ASCII" (CO and GO) will be replaced by the correct designating character sequences as soon as they can be determined. The "binary" repertoire refers to the transparent character set ISO 125.

11. If the "go ahead" profile argument was "true" then following a VT-BREAK, only the association acceptor has the right to send data.

12. 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, ISO 125.

6.10 TRANSPORT PROFILE

The VT profile VT-B-R-Pr-A5 in ISO 9040 will be used as a transparent profile. It is strongly recommended that the profile parameter not be used and supported for the default (transparent) character set is required.

7. DOCUMENT ARCHITECTURE AND INTERCHANGE FORMAT

7.1 INTRODUCTION

Section 7 defines an Implementors' Agreement based on Office Document Architecture (ODA) and Interchange Format, as defined in ISO DIS 8613 and provides detailed specification for the implementor. Such an agreement is termed a Document Application Profile according to ISO DIS 8613.

ISO DIS 8613 has seven parts:

Part 1 of the DIS 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 the document processing model;

Part 4 defines the document profile and its use;

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.

7.1.1 References

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

[1]Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 1: Introduction and General Principles - ISO/DIS 8613/1 June 1987

[2]Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 2: Document Structures - ISO/DIS 8613/2 June 1987

[3]Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 4: Document Profile- ISO/DIS 8613/4 June 1987

[4]Information processing : Text and Office

Systems Office Document Architecture (ODA) and Interchange Format Part 5: Office Document Interchange Format - ISO/DIS 8613/5 June 1987

[5] Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 6: Character Content Architectures - ISO/DIS 8613/6 June 1987

[6] Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 7: Raster Graphics Content Architectures - ISO/DIS 8613/7 June 1987

[7] Information processing : Text and Office Systems Office Document Architecture (ODA) and Interchange Format Part 8: Geometric Graphics Content Architectures - ISO/DIS 8613/8 June 1987

7.2 SCOPE AND FIELD OF APPLICATION

This is the definition of a document application profile suitable for interchanging documents in processable form. This document application profile is defined in accordance with ISO DIS 8613.

The document application profile is intended for transfer of mixed-mode documents between currently existing document processing systems; that is, this DAP is intended for documents potentially containing character text, raster graphics, and geometric graphics. Thus, the document application profile is appropriate for document processing systems that are designed to use non-impact printers but not necessarily designed to use ODA. These are typified by "desk top publishing" systems.

The documents addressed by this document application profile range from simple memos to highly structured technical reports or articles.

This document application profile defines features covering the document characteristics, character content layout and imaging, character repertoire, graphics content, and document management.

7.3 STATUS

This is the third working draft of the ODA/ODIF implementation agreements, October 1987.

7.4 ERRATA

None; in the future this section will contain corrections and clarifications to this version of the agreements.

7.5 ASSUMPTIONS

7.5.1 Conformance to This Document Application Profile

7.5.1.1 ODIF Datastream Conformance

This document application profile (DAP) separates the "permissible" range of values for attributes, as specified in ISO 8613, into "basic" and "non-basic" values. Basic values are a subset of the permissible values that constitute the "basic set." All other permissible values are considered to be non-basic values.

This document application profile defines a conforming "basic datastream" to be a valid ODIF encoding of a document that contains only constituents as defined in this DAP and contains no attributes or values outside of the basic set. A conforming "basic interpreter" is a product that correctly interprets any conforming basic datastream and may have more capability as well. A conforming "basic generator" is a product that produces only conforming basic datastreams, or can reliably be directed to function in a mode of producing only conforming basic datastreams.

7.6 DOCUMENT ARCHITECTURE

7.6.1 Characteristics supported by this document application profile

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 and semantics found in 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 can contain character text, geometric graphics and/or raster graphics contents.

7.6.1.1 Logical characteristics

Logical document structure

The logical structure of documents comprise sections, passages, paragraphs, figures and footnotes. Sections can be nested and automatic section numbering is 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
               Initial text
               Footnote
                    Footnote reference
                    Footnote body
               Continued text
               Figure
               Continued 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 passages.

For example, separate passages may included (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.

Passage

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

A table is a particular case of a passage.

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

The layout of passages is described in 7.6.4.

Section

A section has an automatic section number which precedes any other contents and serves to identify the section for human comprehension.

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

A section may contain one or more passages which may be followed by a sequence of sections within the enclosing section.

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

The layout of sections is described in 7.6.4.

Automatic section numbering

An automatically generated section number consists of a series of numbers separated by instances of an arbitrary specified character string content. It is equal to the automatically generated section number (if any) of the enclosing section followed by a single index number to uniquely identify the section.

Index numbers are generated sequentially within any section. The method of numbering for each level (e.g., the 4th number) must be the same throughout the document. It may be any of:

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

Paragraph

A paragraph is a contiguous amount of character text in the intended reading order.

A paragraph contains zero, one or more embedded footnote references. Multiple consecutive footnote references,

without intervening text, are permitted.

A paragraph contains zero, one or more embedded figure associations. Multiple consecutive figure associations, 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 in some layout features. For example, the document originator may define classes of paragraphs for "abstract", "standard paragraph", "hint" or "summary".

The layout of paragraphs is described in 7.6.4.

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 in order to provide captions or notes.

The layout figures is described in 7.6.4.

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.

The layout of footnotes is described in 7.6.4.

Footnote reference

A footnote reference may have an automatically generated label or one supplied by the user. 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 letters.

7.6.1.2 Layout characteristics

Document Layout Structure

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 page dimensions up to the assured reproduction areas of the ISO A4 nominal page size, in portrait and landscape orientation.

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

Each of these areas must be totally contained within the assured reproduction area of the nominal page dimensions and must not overlap with the other areas.

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

Body area layout

The body area may be subdivided into non-overlapping 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

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

See figure 1 for illustrations.

Header area layout

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

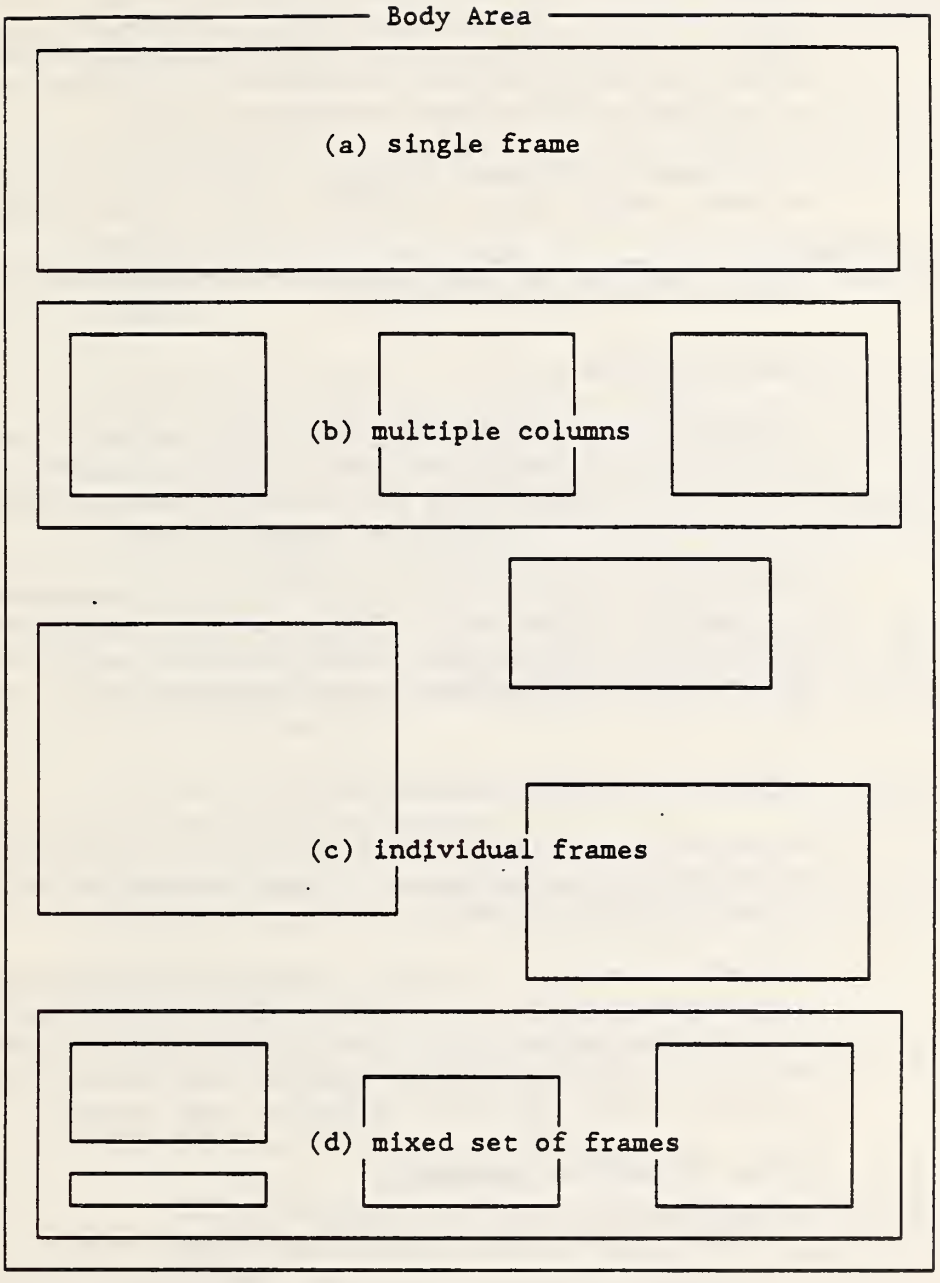

Figure 7.1 Examples of layout within body area

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 a company logo.

Header contents and footer contents

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

An automatically generated page number may be included anywhere within header contents and/or footer contents.

Header contents or footer contents must not include any footnote or footnote reference.

Page numbering

An automatically generated page number may occur at any position within header contents or footer contents. Page numbers may represented by 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. A sub-sequence can be inserted for the purpose of amendment page numbering, e.g., ...6 7 7a 7b 8...

Layout of document logical contents

The sequence of passages and/or sections 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 section contents

A section can be laid out in any of these ways:

a) As a separate passage (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 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 can 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 with in 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 occurred 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)

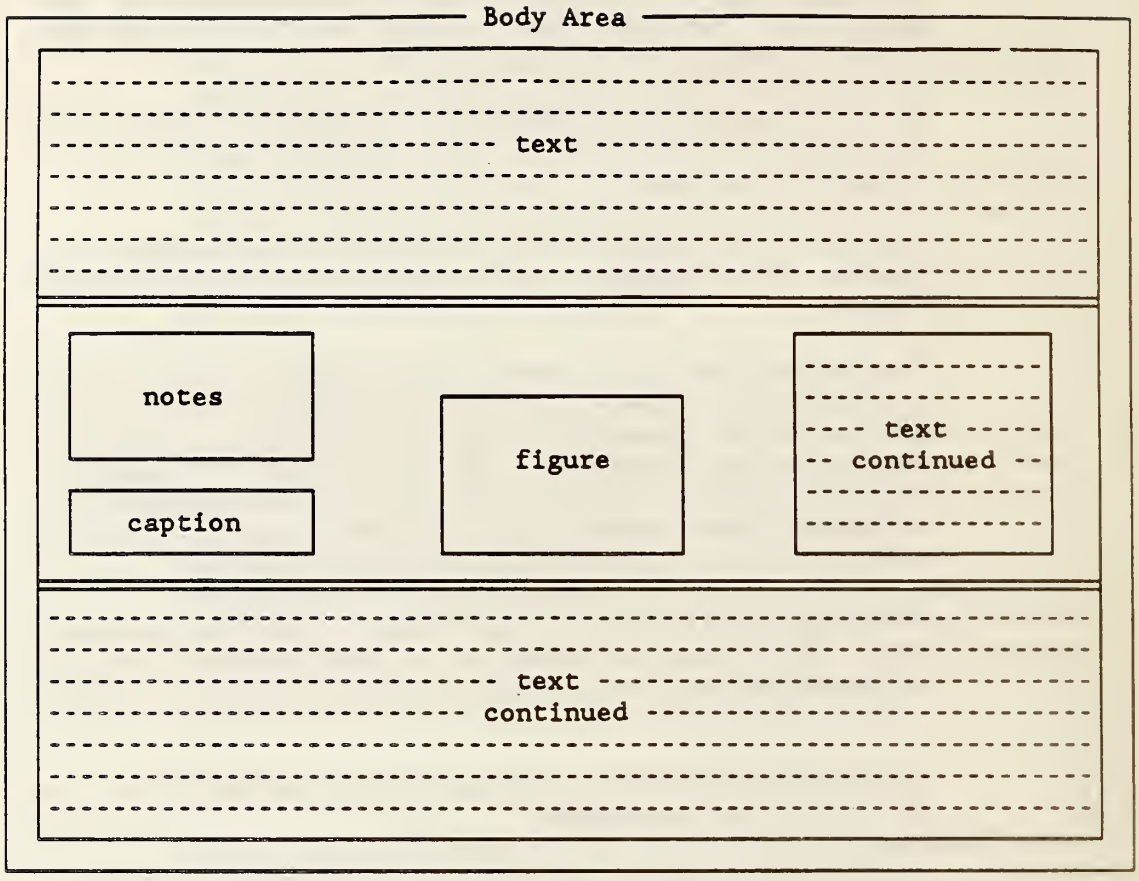

Figure 7.2 Example of text flow around figure

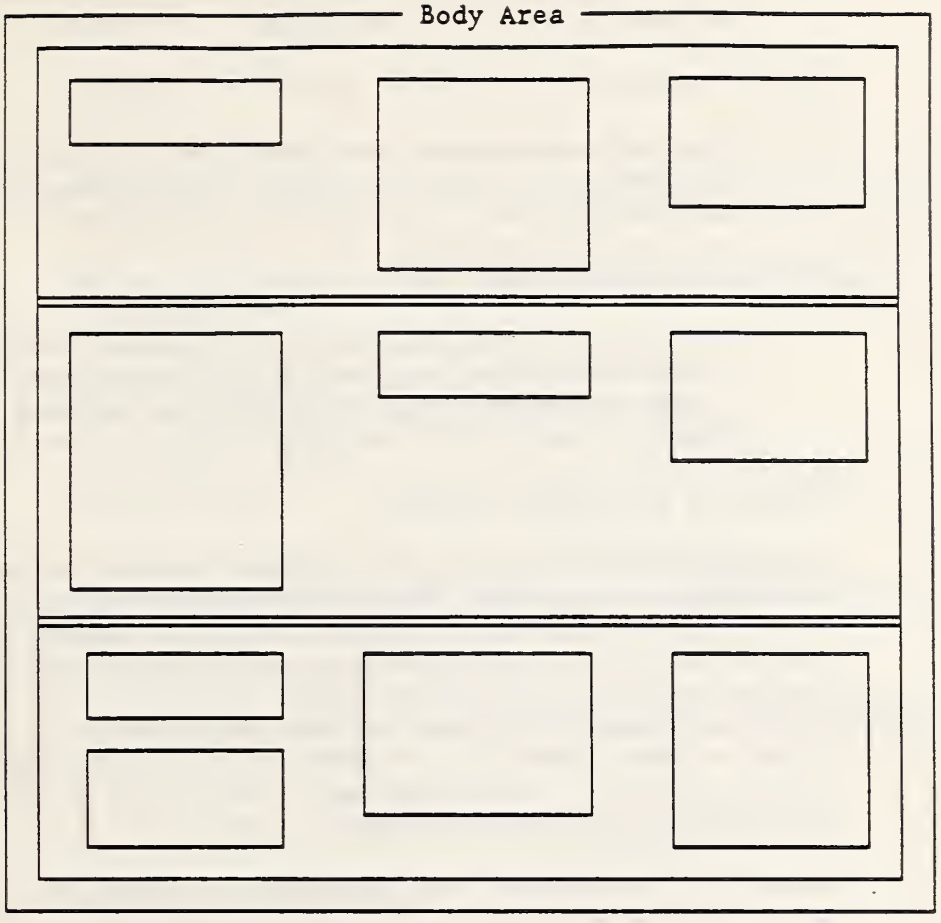

Figure 7.3 Example of synchronized text.

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 (section, paragraph or figure) must be laid out within a single frame, body area or page set.

h) Same page/same area

This specifies that the start of a passage (section, paragraph or figure) 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 section 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 can be laid out in two or more frames to give the effect of text wrapping around a figure. The figure may or may not be logically associated with that paragraph.

Layout of paragraphs can be directed by the controls described above or by the following additional control:

widow and orphan

Note: The widow and orphan feature controls where breaks may occur within the body of a paragraph.

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 frames.

Layout of figure contents

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

Any paragraphs associated with the figure in order 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 is placed at the bottom of a body area of a page and is 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 are placed in the body area in the same order as the reading order of their references.

7.6.1.3 Content Characteristics

The content characteristics of this Document Application Profile are:

1. Raster graphics contents, as detailed in the specification of Group 3 and Group 4 facsimile (CCITT Recommendations T4 and T6);

2. Geometric graphics contents, as detailed in the minimum capabilities defined for the Computer Graphics Metafile standard (ISO 8632);

3. Character contents, as detailed below

Character presentation

Character presentation is controlled by the presentation attributes specified in [ISO 8613-6.2]. Their basic values are summarized below for convenience of reference.

First line format

This produces one of the following effects:

a) A non-indented paragraph
b) An indented paragraph
c) Overhang
d) Overhang with label

Line layout table

This allows a set of tabulation stop positions to be defined with alignment of "star aligned", "end aligned", "centered" or "align around".

Character path

This normally from left to right (0) but the text of a

paragraph may be specified to run from the bottom towards top of page (90).

Alignment

This specifies that the lines of text are to be "start-aligned", "end/aligned", "centered", or "justified".

Line spacing

For fonts with constant height the basic values are 3, 4, 6, 8 or 12 lines per 25.4mm.

Character spacing

For fonts with constant spacing the basic values are 10, 12, or 15 characters per 25.4mm.

Font selection

This allows selection from up to 10 fonts, including proportionally spaced fonts.

Graphic rendition

This allows graphic characters to be presented with a mode of emphasis selected as "normal rendition", italicized", "increased intensity (bold)", "crossed-out", "underlined", or "double underlined".

Character set features and control functions

The list of features and control functions supported includes the following.

The effects of font selection, graphic rendition, character spacing and line spacing can be changed at any point within the text of a paragraph.

Sequences of characters within a line may be subscripted or superscripted.

Text can be aligned with specific tabulation stops.

Text strings can be terminated by a required newline and can be word wrapped within the paragraph margins.

Non-breaking spaces are supported.

Discretionary hyphens are supported.

7.6.1.4 Document profile features

A document profile is associated with the document to provide information to handle it as a whole.

The features supported by this document application profile include all document management attributes defined in [ISO 8613/4].

7.6.2 NOTATION AND CONVENTIONS

7.6.2.1 Notation

The value description of attributes indicates by an asterisk (*) before the attribute value description when the value specified for an object class may be overridden by the value specified for any object of the class. In all other cases the value cannot be overridden.

When the value description specifies "-- any value" this is to be interpreted as meaning any of the values defined as permissible values by ISO 8613.

The notation used to specify attribute values is that of Annex A of ISO DIS 8613/2.2 in all cases where an appropriate notation is defined in that annex (i.e., for construction expressions, string expressions, numeric expressions, object identifier expressions, bindings, references to binding values).

7.6.2.2 Superclasses

The superclass defined in Section 7.6 specifies all the possible generic and specific logical and layout structures that can be interchanged between systems conforming to this NBS Implementor's Agreement.

The generic structures in this implementor's agreement are always complete generic structures. The specific structures must always be instances of the superclass object descriptions. That is, the values of attributes applicable to object descriptions and their associated styles must be specified within the range of permissible values defined for any corresponding object superclass description. Further, for some specified attributes of particular object superclass descriptions the values in corresponding specific objects must not override values specified by the corresponding generic object class description. External documents and resource document, if used, must conform to

the superclass definition.

The superclass is defined both diagrammatically and by way of tables that list all the permissible values of attributes applicable to object class descriptions, object descriptions, and associated styles.

7.6.2.3 Superclass Expressions

Iter, ser, set, any and poss are construction operators used to define the permissible values of the construction expressions in the attribute "generator for subordinates" of all object classes of the superclass.

iter — a construction operator used to indicate that the superclass expression always evaluates to a sequence of instances of the contained superclass expression. Each instance can correspond to a different evaluation of the superclass expression.

ser — a construction operator used to indicate that the superclass expression always evaluates to a sequence of one instance of each of the contained superclass expressions. The instances occur in the sequence in the same order as the contained superclass expressions are specified.

any — a construction operator which is used to indicate that the superclass expression always evaluates to an instance of one of the contained superclass expressions.

poss — a construction operator which is used to indicate that the superclass expression optionally evaluates to either the empty sequence of a superclass expression or to an instance of the contained superclass expression.

set — a construction operator used to indicate that the supercalss expression always evaluates to a sequence of one instance of each of the contained superclass expressions. The instance can occur in any order.

The following rules apply to construction operators applying to a contained superclass expression including an empty sequence.

```
any(<--->,empty sequence,<...>) = any(<--->,<...>)
ser(<--->,empty sequence,<...>) = ser(<--->,<...>)
```

```
set(<--->,empty sequence,<...>) = set(<--->,<...>)
poss(empty sequence)      = empty sequence
iter(empty sequence)      = empty sequence
any (empty sequence)      = empty sequence
ser (empty sequence)      = empty sequence
ser (empty sequence)      = empty sequence
```

opt — a construction operator used to indicate that the superclass expression always evaluates to an optional construction factor which is an instance of the contained superclass expression.

rep — a construction operator used to indicate that the superclass expression always evaluates to a repetitive construction factor which is an instance of the contained superclass expression.

cho — a construction operator used to indicate that the superclass expression always evaluates to a choice construction factor each item of which is an instance of one of the contained superclass expressions.

seq — a construction operator used to indicate that the superclass expression always evaluates to a sequence construction factor each item of which is an instance of one of the contained superclass expressions.

agg — a construction operator used to indicate that the superclass expression always evaluates to an aggregate construction factor each item of which is an instance of one of the contained superclass expressions.

opt rep — a construction operator used to indicate that the superclass expression always evaluates to a repetitive construction factor which is an instance of the contained superclass expression.

7.6.2.4 Use of Binding Expressions

This document application profile permits bindings to be used for automatic numbering schemes, e.g., page numbers and section numbers. This section describes the conventions to be used.

The superclass object specifications identify bindings by names which describe the use of each binding. Any number of bindings may be used corresponding to each name. In order to simplify recognition of bindings, their identifier values

must be allocated as follows (where n is any integer) :

binding name	identifier value
number	8n+1
number string	8n+2
prefix	8n+3
suffix	8n+4
separator	8n+5

7.6.2.4.1 Use of bindings to construct sequential numbers

The binding "number string" of the numbered object is 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 can be of different object classes, sequences are generated by incrementing the value of another binding called "number".

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

```
number              ::=  INC(B_REF(PREC_OBJ(CURR_OBJ))(number))

number string       ::=  <hierarchic exprn> | <simple exprn>

<hierarchic exprn>  ::=  B_REF(SUP_OBJ(CURR_OBJ))(number string)
                         + B_REF(SUP_OBJ(CURR_OBJ))(separator)
                         + <simple exprn>

<simple exprn>      ::=  <string function>
                         (B_REF(CURR_OBJ)(number))
                         | <string function> (ORD(CURR_OBJ))

<string function>   ::=  MK_STR | U_ALPHA | L_ALPHA |
                         U_ROM | L_ROM


Content Generator   ::=  <num st> | <pre st> + <num st> |
                         <num st> + <suf st> |
                         <pre st> + <num st> + <suf st>

<num st>            ::=  B_REF(SUP_OBJ(CURR_OBJ))(number string)

<pre st>            ::=  B_REF(SUP_OBJ(CURR_OBJ))(prefix)
                         | <string literal>
```

<suf st> ::= B_REF(SUP_OBJ(CURR_OBJ))(suffix)
| <string literal>

7.6.2.4.2 Initialization of numbering factors

A "number string" binding must be initialize in an object superior to the relevant numbering scheme (e.g., a passage can initialize a numbering scheme for subordinate sections).

number string ::= " "

A "number" binding, if used, is initialize at each hierarchical level (e.g., section) to start the numbering sequence for subordinates.

number ::= <non-negative integer>

The "prefix", "separator" and "suffix" bindings must be initialize at a level above the numbering scheme and can be respecified at any level within the numbering scheme.

prefix ::= <string literal>

suffix ::= <string literal>

separator ::= <string literal>

7.6.2.5 Object class identifiers

In order to facilitate recognition of structures and semantics, "Object Class Identifiers" must be specified in accordance with a convention that relates them to the relevant object superclass.

With the exception of Document Logical Root and Document Layout Root, all object class identifiers must be specified as a sequence of at least three integers. The first two integers uniquely identify the superclass according to the table below. The remaining integers may be any value to uniquely identify the object class.

Passage	2	2	Pageset	0	2
Section	2	3	Page	0	3
Number	2	4	RPage	0	4
Title	2	5	VPage	0	5
Text&Refs	2	6	HDR	0	6
FNote	2	7	FTR	0	7
FNBody	2	8	BodyFR	0	8
Figure	2	9	FrameA	0	9
Text	2	10	FrameB	0	10
Graphic	2	11	FrameC	0	11
Reference	2	12	FrameD	0	12
Ref	2	13	FrameE	0	13
Raster	2	14	FrameF	0	14
Geometric	2	15	FrameG	0	15
			FrameH	0	16
			Block	0	17

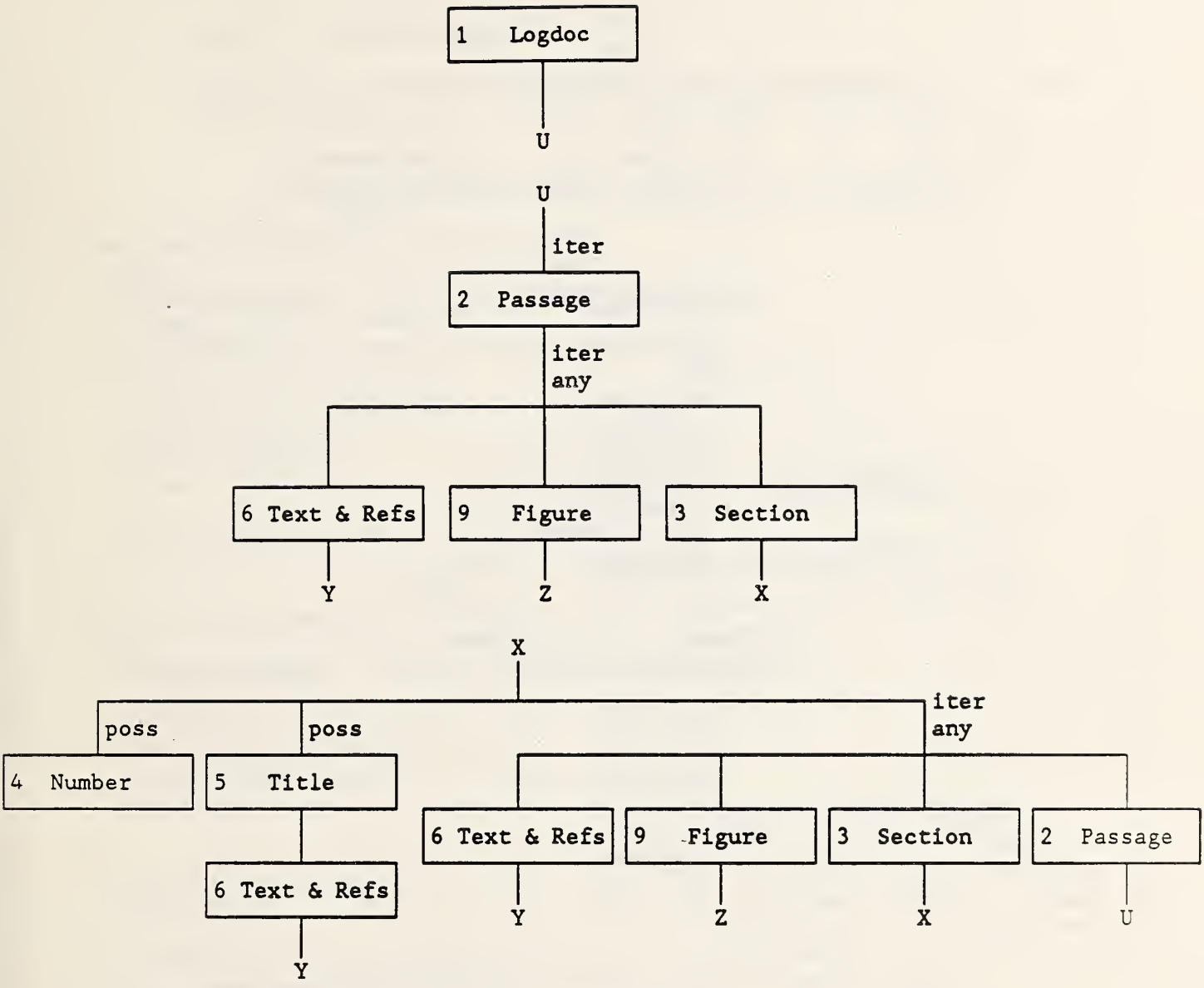

Figure 7.4 Diagram of Logical Structure

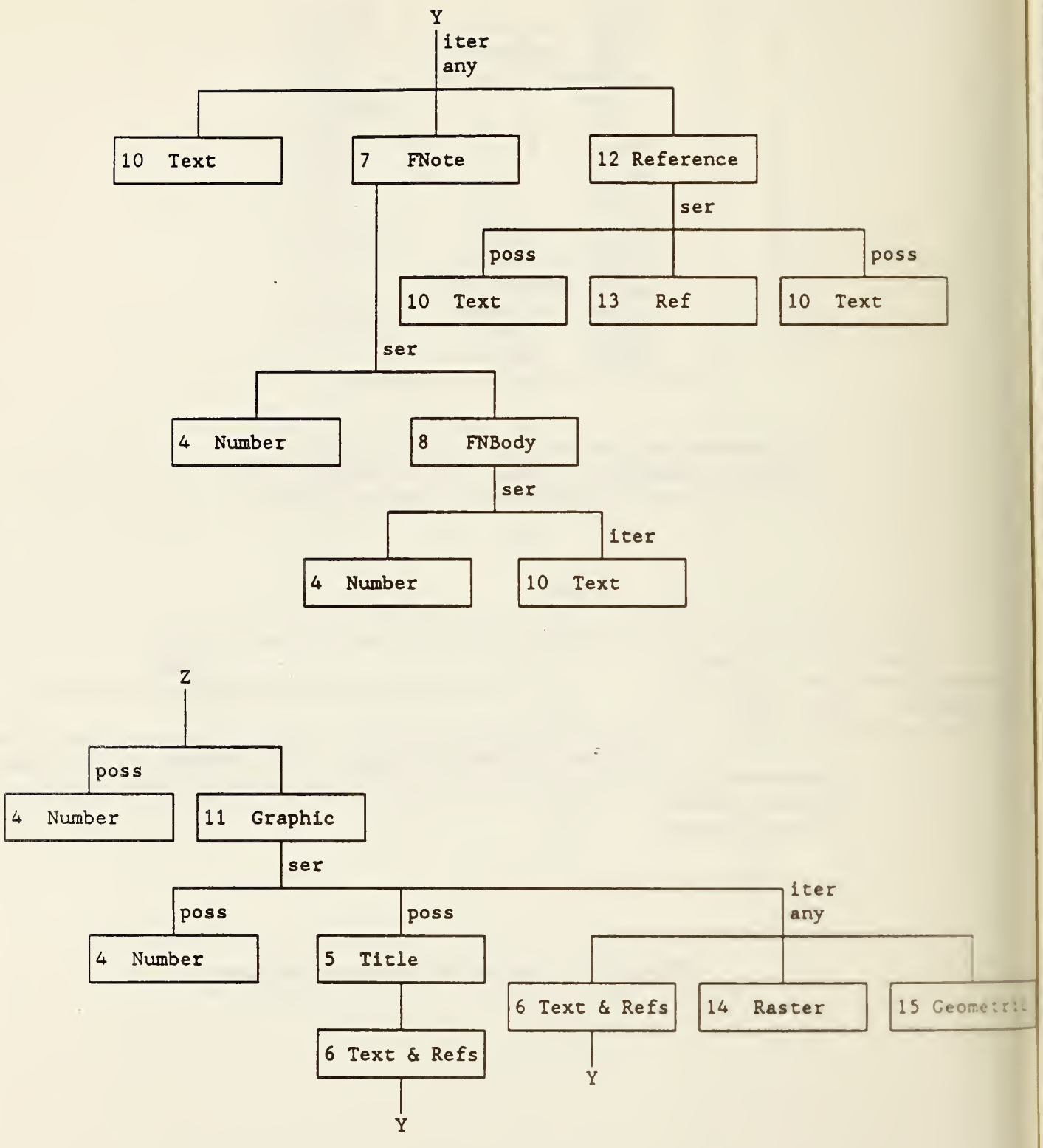

Figure 7.4 Diagram of Logical Structure (continued)

7.6.3 Logical Components

This section contains definitions of the superclass objects shown in the diagram called "Diagram of the Logical Structure."

7.6.3.1 Superclass Name: Logdoc (Logical Document)

Required Attributes

Attribute Name	Value Description
Object Type	'document logical root'
Object Class Identifier	2
Generator for Subordinates	iter(Passage)
Layout Style	-- any value
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- initialization of any: number string, number, prefix, suffix, separator
Default Value Lists	-- any value
Protection	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value
Layout Object Class	0

Permitted Layout Style Attributes

Attribute Name	Value Description
User Readable Comments	-- any value
User Visible Name	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.2 Superclass Name: Passage

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- Passage
Generator for Subordinates	iter(any(Text&Refs, Figure, Section))
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- initialization of any: number string, number, prefix, suffix, separator
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Same Layout Object	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.3 Superclass Name: Section

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- Section
Generator for Subordinates	ser(poss(Number),poss(Title), iter(any(Text&Refs, Figure, Section, Passage)))
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- initialization of any: separator, prefix, suffix, number (for subordinates);use of number and/or number string (to generate number)
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Same Layout Object	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.4 Superclass Name: Number

Required Attributes

Attribute Name	Value Description
Object Type	'basic logical object'
Object Class Identifier	-- Number
Content Generator	-- see Section 7.6.2
Content Portions	-- any value
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
Presentation Style	-- any value
Content Architecture Class	ASN.1 object identifier for character formatted content architecture
User Readable Comments	-- any value
User Visible Name	-- any value
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Block Alignment	-- any value
Concatenation	-- any value
Indivisibility	-- any value
Layout Category	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Offset	-- any value
Same Layout Object	-- any value
Separation	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Required Presentation Style Attributes

Attribute Name	Value Description
Presentation Style Identifier	-- any value

Permitted Presentation Style Attributes

Attribute Name	Value Description
User Readable Comments	-- any value
User Visible Name	-- any value
Layout Texture	-- any value
Border	-- any value
Character Content	-- see Section 7.7.1.1
Presentation Attributes	(Character Formatted)

7.6.3.5 Superclass Name: Title

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- Title
Generator for Subordinates	poss(Text,Refs,Footnote)
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Content Generator	-- see Section 7.6.2
Resource	-- any value
Presentation Style	-- any value
Content Architecture Class	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- see Section 7.6.2
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description

Layout Style Identifier	--	any value

Permitted Layout Style Attributes

Attribute Name		Value Description
Indivisibility	--	any value
Layout Object Class	--	any value
New Layout Object	--	any value
Same Layout Object	--	any value
Synchronization	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.6 Superclass Name: Text&Refs

Required Attributes

Attribute Name		Value Description
Object Type		'composite logical object'
Object Class Identifier	--	Text&Refs
Generator for Subordinates		ser(iter(any(Text,FNote, Reference)))
Object Identifier	--	any value
Object Class	--	identifier of object class of this superclass
Subordinates	--	any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name		Value Description
Resource	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value
Bindings	--	initialization (for numbering subordinate items, reference, figures, etc.) of any: separator, prefix, suffix, number
Protection	--	any value
Layout Style	--	any value

Required Layout Style Attributes

Attribute Name	Value Description

Layout Style Identifier	--	any value

Permitted Layout Style Attributes

Attribute Name		Value Description
Indivisibility	--	any value
Layout Object Class	--	any value
New Layout Object	--	any value
Same Layout Object	--	any value
Synchronization	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.7 Superclass Name: FNote (Footnote)

Required Attributes

Attribute Name		Value Description
Object Type		'composite logical object'
Object Class Identifier	--	FNote
Generator for Subordinates		ser(FNumber,FNBody)
Object Identifier	--	any value
Object Class	--	identifier of object class of this superclass
Subordinates	--	any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name		Value Description
Resource	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value
Bindings	--	use of number and/or number string

Required Layout Style Attributes

Attribute Name		Value Description
Layout Style Identifier	--	any value

Permitted Layout Style Attributes

Attribute Name	Value Description

Indivisibility	--	any value
Layout Object Class	--	any value
New Layout Object	--	any value
Same Layout Object	--	any value
Synchronization	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.8 Superclass Name: FNBody (Footnote Body)

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- FNBody
Generator for Subordinates	ser(Number,Text)
Layout Style	-- any value
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- see Section 7.6.2
Protection	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Layout Object Class	-- any value

User Readable Comments	--	any value
User Visible Name	--	any value
Indivisibility	--	any value
New Layout Object	--	any value
Same Layout Object	--	any value
Synchronization	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.9 Superclass Name: Figure

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- Figure
Generator for Subordinates	ser(poss(Number),Graphic)
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- use of number and/or number string
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Same Layout Object	-- any value

Synchronization	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.10 Superclass Name: Text

Required Attributes

Attribute Name	Value Description
Object Type	'basic logical object'
Object Class Identifier	-- Text
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
Presentation Style	-- any value
Content Architecture Class	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Protection	-- any value
Layout Style	-- any value
Content Portions	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Block Alignment	-- any value
Concatenation	-- any value
Fill Order	-- any value
Indivisibility	-- any value
Layout Category	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Offset	-- any value

Same Layout Object	--	any value
Separation	--	any value
Synchronization	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value

Required Presentation Style Attributes

Attribute Name		Value Description
Presentation Style Identifier	--	any value

Permitted Presentation Style Attributes

Attribute Name		Value Description
User Readable Comments	--	any value
User Visible Name	--	any value
Layout Texture	--	any value
Border	--	any value
Character Content	--	see Sections 7.7.1.2
Presentation Attributes	and 7.7.1.3	

7.6.3.11 Superclass Name: Graphic

Required Attributes

Attribute Name		Value Description
Object Type		'composite logical object'
Object Class Identifier	--	Graphic
Generator for Subordinate		sser(poss(Number), poss(Title), iter (any(Text&Refs,Raster, Geometric)))
Object Identifier	--	any value
Object Class	--	identifier of object class of this superclass
Subordinates	--	any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name		Value Description
Resource	--	any value
User Readable Comments	--	any value
User Visible Name	--	any value
Bindings	--	initialization (for numbering subordinate items, references, figures, etc.) of any: separator, prefix, suffix, number

Default Value Lists	--	any value
Protection	--	any value
Layout Style	--	any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Same Layout Object	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.12 Superclass Name: Reference

Required Attributes

Attribute Name	Value Description
Object Type	'composite logical object'
Object Class Identifier	-- Reference
Generator for Subordinates	ser(poss(Text),Ref, poss(Text))
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates of the object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Bindings	-- use of number and/or number string

Protection	--	any value
Layout Style	--	any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Same Layout Object	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object.

7.6.3.13 Superclass Name: Ref

Required Attributes

Attribute Name	Value Description
Object Type	'basic logical object'
Object Class Identifier	-- Ref
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Content Generator	-- see Section 7.6.2
Content Portions	-- any value
Resource	-- any value
Presentation Style	-- any value
Content Architecture Class	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Block Alignment	-- any value
Concatenation	-- any value
Fill Order	-- any value
Indivisibility	-- any value
Layout Category	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Offset	-- any value
Same Layout Object	-- any value
Separation	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Required Presentation Style Attributes

Attribute Name	Value Description
Presentation Style Identifier	-- any value

Permitted Presentation Style Attributes

Attribute Name	Value Description
User Readable Comments	-- any value
User Visible Name	-- any value
Layout Texture	-- any value
Border	-- any value
Character Content	-- see Sections 7.7.1.2
Presentation Attributes	and 7.7.1.3

7.6.3.14 Superclass Name: Raster

Required Attributes

Attribute Name	Value Description
Object Type	'basic logical object'
Object Class Identifier	-- Raster
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Content Portions	-- any value
Content Architecture Class	ASN.1 object identifier for Raster Graphics Content Architecture
Resource	-- any value
Presentation Style	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Block Alignment	-- any value
Indivisibility	-- any value
Layout Category	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Offset	-- any value
Same Layout Object	-- any value
Separation	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value

Presentation Style Attributes

User Readable Comments	-- any value
User Visible Name	-- any value
Layout Texture	-- any value
Border	-- any value
Raster Graphics Content Presentation Attributes	-- see Section 7.7.2

7.6.3.15 Superclass Name: Geometric

Required Attributes

Attribute Name	Value Description

Object Type	'basic logical object'
Object Class Identifier	-- Geometric
Object Identifier	-- any value
Object Class	-- identifier of object class of this superclass

Permitted Attributes

Attribute Name	Value Description
Content Portions	-- any value
Content Architecture Class	ASN.1 object identifier for Geometric Graphics Content Architecture
Resource	-- any value
Presentation Style	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Protection	-- any value
Layout Style	-- any value

Required Layout Style Attributes

Attribute Name	Value Description
Layout Style Identifier	-- any value

Permitted Layout Style Attributes

Attribute Name	Value Description
Indivisibility	-- any value
Layout Category	-- any value
Layout Object Class	-- any value
New Layout Object	-- any value
Offset	-- any value
Same Layout Object	-- any value
Separation	-- any value
Synchronization	-- any value
User Readable Comments	-- any value
User Visible Name	-- any value
Block Alignment	-- any value

Presentation Style Attributes

User Readable Comments	-- any value
User Visible Name	-- any value
Layout Texture	-- any value
Border	-- any value
Geometric Graphics Content Presentation Attributes	-- see Section 7.7.3

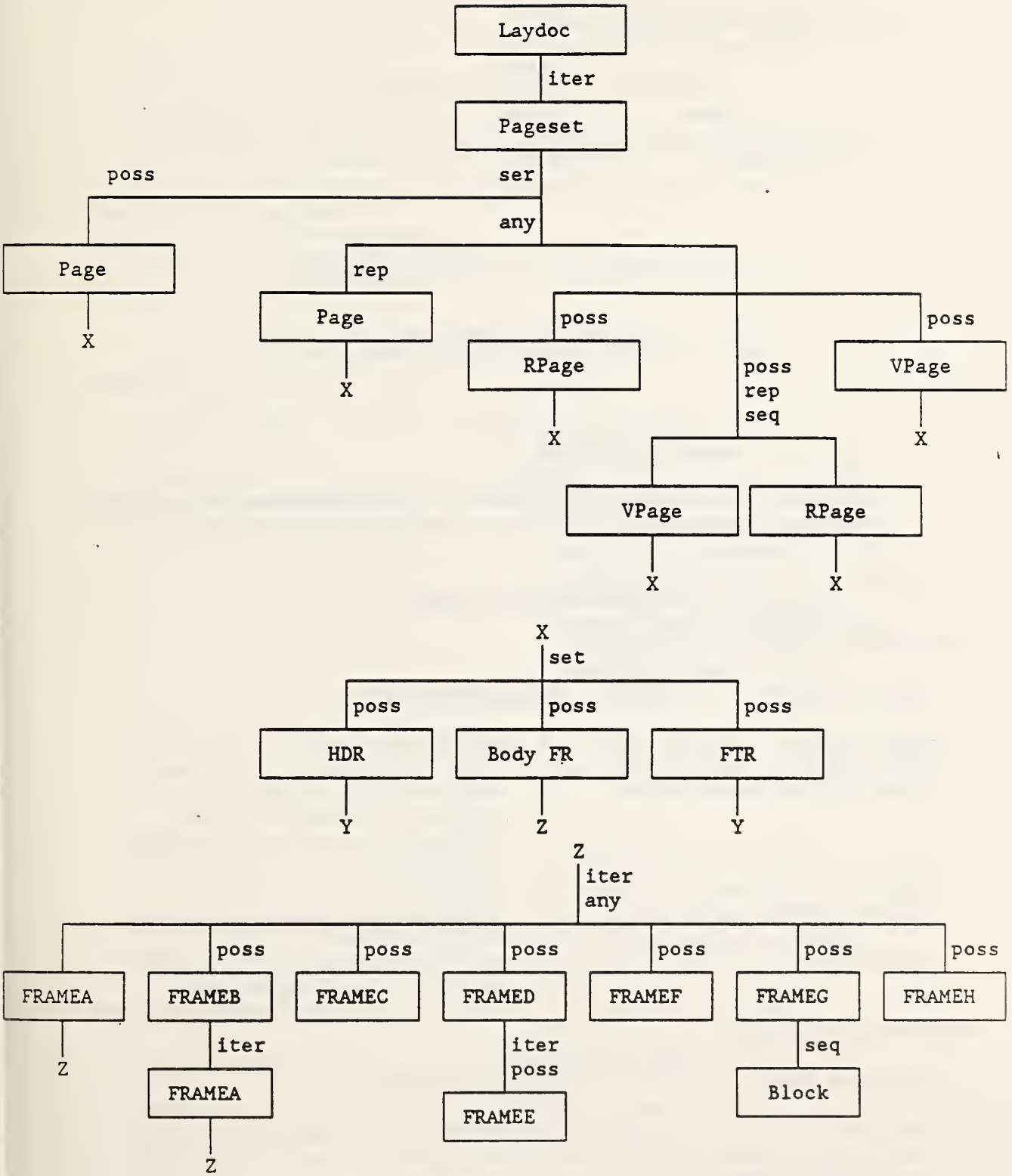

Figure 7.5 Diagram of Layout Structure

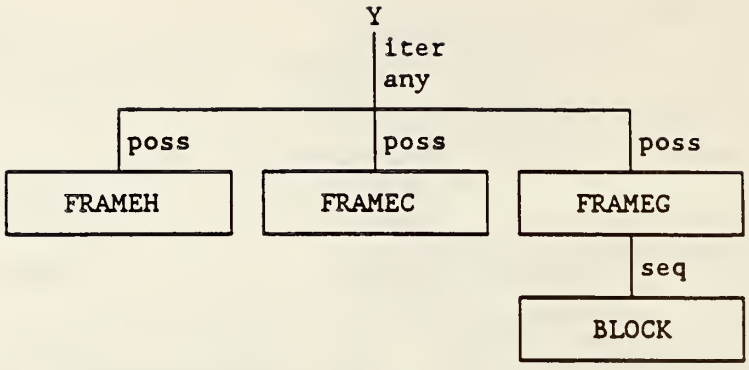

Figure 7.5 Diagram of Layout Structure (continued)

7.6.4 Layout Components

This section contains definitions of the superclass objects shown in the diagram called "Diagram of the Layout Structure."

7.6.4.1 Superclass Name: Laydoc

Required Attributes

Attribute Name	Value Description
Object Type	'document layout root'
Object Class Identifier	0
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(PageSet)
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Default Value Lists	-- any value
Bindings	-- one or more values, each of which

	initializes or increments a numbering system associated with the binding identifier

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.2 Superclass Name: Pageset

Required Attributes

Attribute Name	Value Description
Object Type	Pageset
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: ser(poss(PAGE), any(REP(PAGE),SEQUENCE(poss (RPAGE),poss(rep (SEQUENCE(VPAGE,RPAGE)), poss(VPAGE))))

Note: Each of the two instances of RPAGE refer to the same generic object class. Similarly, each of the two instances of VPAGE refer to the same generic object class.

Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates
Bindings	PgNum,<numeric literal>

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with

the binding identifier

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

Binding	Description
PgNum	Initializes Page Number

7.6.4.3 Superclass Name: Page

Required Attributes

Attribute Name	Value Description
Object Type	Page
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: set(poss(HDR), poss(BodyFR), poss(FTR))
Bindings	PgNum,Inc(B-Ref(PREC (CURR-OBJ))(PgNum))
Dimensions	-- dimensions are any of the assured reproduction areas for ISO A4, ISO A3 or North American letter.
Medium Type	
Nominal Page Size	-- any value
Side of Sheet	'unspecified'
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Layout Texture	-- any value
Page Position	-- any value
Bindings	-- one or more values, each of which initializes or increments a

numbering system associated with the binding identifier

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

Binding	Description
PgNum	Increment Page Number

7.6.4.4 Superclass Name: RPage

Required Attributes

Attribute Name	Value Description
Object Type	Page
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: set(poss(HDR) poss(BodyFR) poss(FTR))
Bindings	PgNum, Inc(B-Ref(PREC (CURR-OBJ))(PgNum))
Dimensions	-- dimensions are any of the assured reproduction areas for ISO A4, ISO A3 or North American letter.
Medium Type	
Nominal Page Size	-- any value
Side of Sheet	'recto'
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value

Layout Texture	-- any value
Page Position	-- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

Binding Name	Description
PgNum	Increment Page Number

7.6.4.5 Superclass Name: VPage

Required Attributes

Attribute Name	Value Description
Object Type	Page
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: set(poss(HDR) poss(BodyFR)
Bindings	PgNum,Inc(B-Ref(PREC (CURR-OBJ))(PgNum)) poss(FTR))
Dimensions	-- dimensions are any of the assured reproduction areas for ISO A4, ISO A3 or North American letter.
Medium Type	
Nominal Page Size	-- any value
Side of Sheet	'verso'
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value

User Visible Name	* -- any value
Layout Texture	-- any value
Page Position	-- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

Binding	Description
PgNum	Increment Page Number

7.6.4.6 Superclass Name: Header (HDR)

Required Attributes

Attribute Name	Value Description
Object Type	Frame (composite)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter (any(poss(FrameH), poss(FrameC), poss(FrameG))) Position--any constant value x=<any>,y=<any>
Dimensions	-- any constant value h=<any>,v=<any>
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value

Bindings	--	one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture	--	any value
Border	* --	any value
Layout Path	--	any value
Permitted Categories	--	any value
Imaging Order	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.7 Superclass Name: Footer (FTR)

Required Attributes

Attribute Name	Value Description
Object Type	Frame (composite)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(any(poss(FrameH), poss(FrameC), poss(FrameG)))
Position	-- any constant value x=<any>, y=<any>
Dimensions	-- any constant value h=<any>, v=<any>
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier

Layout Texture	-- any value
Border	-- any value
Layout Path	-- any value
Permitted Categories	-- any value
Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.8 Superclass Name: BodyFR

Required Attributes

Attribute Name	Value Description
Object Type	Frame (composite)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(any(poss(FrameA), poss(FrameB), poss(FrameC), poss(FrameD), poss(FrameF), poss(FrameG),poss(FrameH)))
Position	-- any constant value x=<any>, y=<any>
Dimensions	-- any constant value h=<any>,v=<any>
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier

Layout Texture	-- any value
Border	-- any value
Layout Path	-- any value
Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.9 Superclass Name: FrameA

The use of this frame superclass is illustrated in Figure 1, case b and in ISO DIS 8613/2.2, Annex D, Clause D.1.6.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(any(-poss(FrameA), poss(FrameB), poss(F-rameC), poss(FrameD), poss(FrameF), poss(FrameG), poss(FrameH)))
Position	-- any constant values x=<any>, y=<any>
Dimensions	h=<any>; value b
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame
Permitted Categories	-- any value

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value

User Visible Name	*	-- any value
Bindings		-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture		-- any value
Border	*	-- any value
Layout Path		-- any value
Imaging Order		-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.10 Superclass Name: FrameB

The use of this frame superclass is illustrated in Figure 1, case b and in ISO DIS 8613/2.2, Annex D, Clause D.1.6.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (composite)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(FrameA)
Position	positioning rule (<any>)
Note: see ISO DIS 8613/1.1, 5.4.1.1.	
Dimensions	h=default; v=rule b
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value

User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture	-- any value
Border	-- any value
Layout Path	-- any value
Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.11 Superclass Name: FrameC

The use of this frame superclass is illustrated in Figure 1, case a and in ISO DIS 8613/2.2, Annex D, Clause D.1.3.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Position	positioning rule (<any>)
Note: see ISO DIS 8613/1.1, 5.4.1.1.	
Dimensions	h=default; v=rule b
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame
Permitted Categories	-- any value

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a

		numbering system associated with the binding identifier
Layout Texture	--	any value
Border	--	any value
Layout Path	--	any value
Imaging Order	--	any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.12 Superclass Name: FrameD

The use of this frame superclass is illustrated in Figure 2, and in ISO DIS 8613/2.2, Annex D, Clause D.1.4 and D.1.5.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (composite)
Object Class Identifier	-- any value
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: iter(poss(FrameE))
Position	positioning rule (<any>)
Note: see ISO DIS 8613/1.1, 5.4.1.1.	
Dimensions	h=default; v=rule a
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- any value corresponding to the generator for subordinates

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with

		the binding identifier
Layout Texture		-- any value
Border	*	-- any value
Layout Path		-- any value
Imaging Order		-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.13 Superclass Name: FrameE

The use of this frame superclass is illustrated in Figure 2, and in ISO DIS 8613/2.2, Annex D, Clause D.1.4 and D.1.5.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Position	positioning rule (<any>) Note: see ISO DIS 8613/1.1, 5.4.1.1.
Dimensions	h=rule b; v=rule b Note: see ISO DIS 8613/1.1, 5.4.1.2.
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame
Permitted Categories	-- any value

Permitted Attributes

Attribute Name		Value Description
Resource		-- any value
User Readable Comments	*	-- any value
User Visible Name	*	-- any value
Bindings		-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture		-- any value
Border	*	-- any value
Layout Path		-- any value

Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.14 Superclass Name: FrameF

The use of this frame superclass is illustrated in ISO DIS 8613/2.2, Annex D, Clause D.1.7.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Position	x=<any>; y=(order=reversed, distance=<any>)
Note: see ISO DIS 8613/1.1, 5.4.1.1.	
Dimensions	h=default; v=rule b
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame
Permitted Categories	-- any value

Permitted Attributes

Attribute Name		Value Description
Resource		-- any value
User Readable Comments	*	-- any value
User Visible Name	*	-- any value
Bindings		-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture		-- any value
Border	*	-- any value
Layout Path		-- any value
Imaging Order		-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.15 Superclass Name: FrameG

The use of this frame superclass is illustrated in Figure 1, case c and in ISO DIS 8613/2.2, Annex D, Clause D.1.6.

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Position	-- any constant value x=<any>,y=<any>
Dimensions	-- any constant value h=<any>,v=<any>
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame
Permitted Categories	-- any value

Permitted Attributes

Attribute Name	Value Description
Generator for Subordinates	-- any construction expression that is an instance of the following superclass expression: seq(BLOCK)
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture	-- any value
Border	-- any value
Layout Path	-- any value
Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.16 Superclass Name: FrameH

Required Attributes

Attribute Name	Value Description
Object Type	Frame (basic)
Object Class Identifier	-- any value
Position	positioning rule (<any>)
Note: see ISO DIS 8613/1.1, 5.4.1.1.	
Dimensions	h=default; v=rule b
Note: see ISO DIS 8613/1.1, 5.4.1.2.	
Logical Source	-- any value
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Subordinates	-- identifies a number of blocks within the frame

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Bindings	-- one or more values, each of which initializes or increments a numbering system associated with the binding identifier
Layout Texture	-- any value
Border	-- any value
Layout Path	-- any value
Imaging Order	-- any value

Presentation Style Attributes

Presentation style attributes are not applicable to this object superclass.

Reserved Bindings

There are no standard bindings for this object superclass.

7.6.4.17 Superclass Name: Block

Required Attributes

Attribute Name	Value Description
Object Type	Block
Object Class Identifier	-- any value
Content Architecture Class	-- any permitted by Clause 7.7
Position	-- any constant value x=<any>,y=<any>
Dimensions	-- any constant value h=<any>,v=<any>
Object Identifier	-- any value
Object Class	-- identifier of an object class of this superclass
Content Portions	-- any value
Content Generator	-- any value

Note: One of the attributes "content portions" or "content generator" is required to be specified. Specification of both attributes for the same generic object is not permitted.

Permitted Attributes

Attribute Name	Value Description
Resource	-- any value
User Readable Comments	* -- any value
User Visible Name	* -- any value
Layout Texture	-- any value
Border	* -- any value
Presentation Style	-- any value
Presentation Attributes	-- any value

Presentation Style Attributes

Presentation style attributes applicable to this object superclass are to be consistent with the value specified for Content Architecture Class. All presentation attributes specified for the Content Architecture Class in clause 7.7 can be specified.

Reserved Bindings

Not applicable as the attribute bindings is not permitted.

7.6.5 Attributes

7.6.5.1 Attribute Applicability

This section identifies the attributes that are permitted for the logical and layout components, layout styles and presentation styles.

Shared Attributes

This section identifies the attributes that are permitted for both the logical and layout components. (See Table 2.)

Layout Attributes

This section identifies the attributes that are permitted on layout components. (See Table 3.)

Logical Attributes

This section identifies the attributes that are permitted on logical components.

Table 7.4 Attributes which may be specified for constituents (continued),logical attributes

Logical Attributes Attribute Name	Document Logical Root	Composite Logical Object	Basic Logical Object	
Protection	NM/D	NM/D	NM/D	+++++
Layout Style	M/D	NM/D	NM/D	+++++

Layout Directive Attributes

This section identifies the attributes that are permitted for layout directives.

All layout directives are permitted in layout styles only.

Attributes which may be specified for constituents (continued), layout directive attributes

Table 2 - Attributes which may be specified for constituents, shared attributes

Shared Attributes Attribute Name	Document Layout Root	Page Set	Page (Composite)	Frame	Block	Document Logical Root	Composite Logical Root	Basic Logical Object	Presentation Style	Layout Style
Object Type	M/D	M/D	M/D	M/D	M/D	M/D	M/D	M/D	---	- - -
Object Identifier	--/M	- - / M	--/M	--/M	--/M	--/M	- - / M	- - / M	---	- - -
Object Class Identifier	M/--	M / - -	M/--	M/--	M/--	M/--	M / - -	M / - -	---	- - -
Generator for Subordinates	M / - -	M / - -	M/--	M/--	---	M / - -	M / - -	- - -	- - -	- - -
Content Generator	---	---	---	---	NM/--	---	---	NM/--	- - -	- - -
Object Class	- - / M	- - / M	--/M	--/M	NM/--	- - / M	- - / M	- - / M	- - -	- - -
Subordinates	- - / M	- - / M	--/M	--/M	---	- - / M	- - / M	---	- - -	- - -
Content Portions	---	---	---	---	NM/NM	---	- - -	NM/NM	- - -	- - -
Resource	NM/--	NM/--	NM/--	NM/--	NM/D	NM/--	NM/--	M/--	- - -	- - -
Presentation Style	---	---	---	---	NM/D	- - -	- - -	NM/D	- - -	- - -
Content Architecture Class	---	---	---	---	NM/D	---	---	NM/D	- - -	- - -
Content Type	---	---	---	---	---	---	---	---	- - -	- - -
Presentation Attributes	---	---	---	---	---	---	---	---	NM	- - -
User-Readable Comments	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM	NM
User-Visible Name	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM	NM
Bindings	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	NM/D	- - -	- - -
Default Value Lists	NM/NM	NM/NM	NM/NM	NM/D	---	NM/NM	NM/NM	---	- - -	- - -

Key:

M: Mandatory; NM: Non-Mandatory; D: Defaultable; --: Not applicable;

Table 7.3 Attributes which may be specified for constituents (continued), layout attributes

Layout Attributes Attribute Name	Document Layout	Page Set	Page (Composite)	Frame	Block
Position	-----	-----	-----	NM/D	NM/D
Dimensions	-----	-----	NM/D	NM/D	NM/D
Layout Texture	-----	-----	NM/D	NM/D	NM/D
Border	-----	-----	-----	NM/D	NM/D
Balance	NM/D	NM/D	NM/D	NM/D	-----
Layout Path	-----	-----	-----	NM/D	-----
Logical Source	-----	-----	-----	NM/--	-----
Permitted Categories	-----	-----	-----	NM/D	-----
Imaging Order	-----	-----	--/NM	--/NM	-----
Page Position	-----	-----	NM/D	-----	-----
Medium Type	-----	-----	NM/D	-----	-----

Key:
M: Mandatory; NM: Non-Mandatory; D: Defautable;
--: Not Applicable

Table 7.5 Attributes which may be specified for constituents (continued), layout directive attributes

Layout Directives Attribute Name	Document Logical Root	Composite Logical Object	Basic Logical Object	Layout Style
Layout Directive Attributes				
Block alignment	----	----	----	NM
Concatenation	----	----	----	NM
Fill order	----	----	----	NM
Indivisibility	----	----	----	NM
Layout Category	----	----	----	NM
Layout Object Class	----	----	----	NM
New layout object	----	----	----	NM
Offset	----	----	----	NM
Same layout object	----	----	----	NM
Separation	----	----	----	NM
Synchronization	----	----	----	NM

Key:
M : Mandatory; NM : Non-Mandatory; D : Defaultable;
-- : Not applicable

Layout Style Attributes

This section identifies the attributes that are permitted for layout styles.

Table 7.6 Attributes which may be specified for constituents (continued), layout style attributes

Layout Style Attributes Attribute Name	Layout Style
Layout Style Identifier	M
User-Readable Comments	NM
User-Visible Name	NM

Presentation Style Attributes

This section identifies the attributes that are permitted for presentation styles.

Table 7.7 Attributes which may be specified for constituents (continued), presentation style attributes

Presentation Style Attributes Attribute Name	Presentation Style
Presentation Style Identifier	M
Presentation Attributes	NM
User-Readable Comments	NM
User-Visible Name	NM
Layout Texture	NM
Border	NM

Content Portion Attributes

This section identifies the attributes that are permitted for content portion attributes.

Table 7.8 Attributes which may be specified for constituents (concluded), content portion attributes

Content portion Attributes Attribute Name	Content portion
Content identifier - logical	M
Content identifier - layout	M
Type of Coding	NM
Content information	NM
Alternative Representation	NM
Coding attributes	*

* Classification defined in each content architecture.

Key:
M : Mandatory; NM : Non-Mandatory; D : Defaultable;
-- : Not applicable;

7.6.5.2 Attribute Values

This section defines the basic, non-basic and default values for the allowed attributes.

Shared Attributes

The attributes defined in this section can be specified for logical and/or layout components.

Attribute	Basic Value	Non-Basic Value	Default Value
Object Type	Any	None	None
Object ID	As defined in 8613/2.2	None	None
Object Class ID	As defined in 8613/2.2	None	None
Generator for Subordinates	Construction Expression	None	None
Content Generator	As defined in 8613/2.2	None	None
Object Class	As defined in 8613/2.2	None	None
Subordinates	As defined in 8613/2.2	None	None
Content Portions	As defined in 8613/2.2	None	None
Resource	As defined in 8613/2.2	None	None
Presentation Style	As defined in 8613/2.2	None	None
Content Architecture Class	As defined in 8613/2.2	None	None
Content Type	Not Supported in this Profile		
User-readable Comments	As defined in 8613/2.2	None	None
User-readable Name	As defined in 8613/2.2	None	None
Bindings	As defined in 8613/2.2	None	None
Default Value Lists	As defined in 8613/2.2	None	None

Layout Attributes

The attributes defined in this section can be specified for layout components.

Attribute	Basic Value	Non-Basic Value	Default Value
Position	As defined in 8613/2.2	None	None
Dimensions	As defined in 8613/2.2	None	None
Exception: Subparameter "variable page height" of parameter "vertical dimension" is not supported.			
Layout Texture	As defined in 8613/2.2	None	None
Border	As defined in 8613/2.2	None	None
Balance	As defined in 8613/2.2	None	None
Layout Path	0, 90, 180 270	None	None
Logical Source	As defined in 8613/2.2	None	None
Permitted Categories	As defined in 8613/2.2	None	None
Imaging Order	As defined in 8613/2.2	None	None
Page Position	As defined in 8613/2.2	None	None
Medium Type	As defined in 8613/2.2	None	None

Logical Attributes

The attributes defined in this section can be specified for logical components.

Attribute	Basic Value	Non-Basic Value	Default Value
Protection	As defined in 8613/2.2	None	None
Layout Style	As defined in 8613/2.2	None	None
Layout Style ID	As defined in 8613/2.2	None	None
Block Alignment	As defined in 8613/2.2	None	None
Concatenation	As defined in 8613/2.2	None	None
Fill Order	As defined in 8613/2.2	None	None
Indivisibility	As defined in 8613/2.2	None	None
Layout Category	As defined in 8613/2.2	None	None
Layout Object Class	As defined in 8613/2.2	None	None
New Layout Object	As defined in 8613/2.2	None	None
Offset	As defined in 8613/2.2	None	None
Same Layout Object	As defined in 8613/2.2	None	None
Separation	As defined in 8613/2.2	None	None
Synchronization	As defined in 8613/2.2	None	None

Presentation Style Attributes

The attributes defined in this section can be specified for presentation styles. Presentation styles may be applied to both logical and layout components.

Attribute	Basic Value	Non-Basic Value	Default Value
Presentation Style ID	As defined in 8613/2.2	None	None

Content Portion Attributes

The attributes defined in this section can be specified for the content portions.

Attribute	Basic Value	Non-Basic Value	Default Value
Content ID -logical -layout	As defined in 8613/2.2	None	None
Type of Coding	As defined in 8613/2.2	None	None
Content Information	As defined in 8613/2.2	None	None
Alternative Representation	As defined in 8613/2.2	None	None

7.7 Content Architecture

This document application profile supports three content architectures: character, raster graphics, and geometric graphics. The character content architectures permit the inclusion in a document of content portions that contain graphic characters. The raster graphics content architectures permit the inclusion in a document of content portions that contain picture elements (pels). The geometric graphics content architectures permit the inclusion in a document of content portions that contain primitive graphic objects such as points, polylines, polygons, and arcs.

7.7.1 Character Content Architecture Levels

The content architecture levels defined are character formatted 3 (CF3), character processable 3 (CP3), and character formatted processable 3 (CFP3).

CF3 content architecture is an enhanced formatted form architecture which does not correspond to any existing standard and which incorporates all features defined for its class in ISO 8613.

CP3 content architecture is a processable form content architecture which does not correspond to any existing standard and which incorporates all the features defined for its class in ISO 8613.

CFP3 content architecture is a formatted processable form content architecture which does not correspond to any existing standard and which incorporates all the features defined for its class in ISO 8613.

7.7.1.1 Character Formatted

This character formatted content architecture level may be used in any basic object. Basic, non-basic and default values are specified in the following tables.

7.7.1.1.1 Presentation Attributes

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Alignment	start aligned end aligned centered justified	none	start aligned
Alignment Indicator	not aligned aligned	none	not aligned
Character Fonts	none	any	none
Character Orientation	0 degrees	90, 180, 270 degrees	0 degrees
Character Path	0, 90 degrees	180, 270 degrees	0 degrees
Character Spacing	80, 100, 120 SMUs	any positive value	120 SMUs
First Line Format	1) indentation overhang overhang s-a item overhang e-a item 2) any non-negative value	none none	indentation 0
Graphic Character Sets	The graphic character sets of ISO 6937/2 + ISO 8859/1	Any other registered character sets	ISO 6937/2
Graphic Character Subrepertoire	Subrepertoire of ISO 6937/2 equivalent to ISO 8859/1 & subrepertoire of ISO 6937/2 equivalent to Teletex	Any other registered subrepertoire of ISO 6937/2	Subrepertoire of ISO 6937/2 equivalent to ISO 8859/1
Graphic Rendition	0,1,3-4,9,10, 19,21-24,29	2, 5-7, 25-27	0
Initial Offset	1) Any non-negative value 2) Any non-negative value	none none	0 120 SMU

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Kerning Offset	1) Any non-negative value negative value	none	0
Line Layout Table	1) Any	none	no default
	2) Any	none	no default
	3) start-aligned end-aligned centered aligned-around	none	no default
	4) Any	none	no default
Line Progression	270 degrees	90 degrees	270 degrees
Line Spacing	100, 150, 200, 300, 400 SMUs	any other positive value	200 SMUs
Precision	1) Any positive value	none	1
	2) Any positive value	none	1

7.7.1.1.2 Content Elements

The graphic characters used by this content architecture level may be taken from any registered character set subject only to the restrictions defined in ISO 8613. The basic, non-basic, and default characters sets are defined by the presentation attribute "Graphic Character Sets" in 7.7.1.1.1.

7.7.1.1.3 Control Functions

Control functions with parameters

Control Functions	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Character Position Backward (HPB)	Any positive value	none	120 SMUs
Character Position Relative (HPR)	Any positive value	none	120 SMUs
Graphic Character Composition (GCC)	0, 1, 2	none	0
Identify Graphic subrepertoire (IGS)	0	Any other registered subrepertoire of ISO 6937/2	no default
Line Position Backward (VPB)	Any positive value	none	100 SMUs
Line Position Relative (VPR)	Any positive value	none	100 SMUs
No Justify (JTF)	0	none	0
Select Character Spacing (SHS)	0, 1	2, 3	0
Select Graphic Rendition (SGR)	0, 1, 3-4, 9, 10-19, 21-24, 29	2, 5-7 25-27	0
Select Line Spacing (SVS)	0, 1, 2, 3, 4	9	0
Selective Tabulation (STAB)	Any	none	no default
Set Additional Character Spacing (SACS)	Any	none	0
Set Space Width (SSW)	Any positive value	none	if variable specify character "space", else 120 SMUs
Spacing Increment (SPI)	Any positive value Any positive value	none none	current line spacing current character spacing

Control Functions	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Start Reverse String (SRS)	0, 1	none	0

Control functions without parameters

Backspace (BS)
Carriage Return (CR)
Line Feed (LF)
Partial Line Down (PLD)
Partial Line Up (PLU)
Space (SP)
Substitute (SUB)

Code extension control functions

Any code extension control function defined in ISO 2022 is permitted. Interpretation and rendition of code extensions are implementation dependent.

7.7.1.1.4 Type of Coding

The value of this attribute is an ASN.1 object identifier as defined in ISO 8613 Part 6.

7.7.1.1.5 Coding Attributes

No coding attributes are defined for this content architecture level.

7.7.1.2 Character Processable

This character processable content architecture level may be used in any basic logical object. Basic, non-basic and default values are specified in the following tables.

7.7.1.2.1 Presentation Attributes

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Alignment	start aligned end aligned centered justified	none	start aligned
Character Fonts	none	any	no default
Character Orientation	0 degrees	90, 180, 270 degrees	0 degrees
Character Path	0, 90 degrees	180, 270 degrees	0 degrees
Character Spacing	80, 100, 120 SMUs	Any other positive value	120 SMUs
First Line Format	1) indentation overhang overhang s-a item overhang e-a item 2) any non-negative value	none none	indentation 0
Graphic Character Sets	The graphic character sets of ISO 6937/2 + ISO 8859/1	Any other registered character sets	ISO 6937/2
Graphic Character Subrepertoire	Subrepertoire of ISO 6937/2 equivalent to ISO 8859/1 & subrepertoire of ISO 6937/2 equivalent to Teletex	Any other registered subrepertoire of ISO 6937/2	Subrepertoire of ISO 6937/2 equivalent to ISO 8859/1
Graphic Rendition	0, 1, 3-4, 9, 10 -19, 21-24, 29	2, 5-7, 25-27	0
Indentation	Any non-negative value	none	0
Kerning Offset	1) Any non-negative value 2) Any non-negative value	none none	0 0

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Leading	yes, no	none	no
Line Layout Table	1) Any	none	no default
	2) Any	none	no default
	3) start-aligned end-aligned centered aligned-around	none	no default
	4) Any	none	no default
Line Progression	270 degrees	90 degrees	270 degrees
Line Spacing	100, 150, 200, 300, 400 SMUs	any other positive value	200 SMUs
Orphan Size	Any positive value	none	1
Pairwise Kerning	yes, no	none	no
Precision	1) Any positive value	none	1
	2) Any positive value	none	1
Window Size	Any positive value	none	1

7.7.1.2.2 Content Elements

The graphic characters used by this content architecture level may be taken from any registered character set subject only to the restrictions defined in ISO 8613. The basic, non-basic, and default characters sets are defined by the presentation attribute "Graphic Character Sets" in 7.7.1.2.1.

7.7.1.2.3 Control Functions

Control functions with parameters

Control Functions	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Graphic Character Composition (GCC)	0, 1, 2	none	0
Identify Graphic Subrepertoire (IGS)	0	Any other registered subrepertoire of ISO 6937/2	no default
Line Position Backward (VPB)	Any positive value	none	100 SMUs
Line Position Relative (VPR)	Any positive value	none	100 SMUs
Parallel Texts (PTX)	0, 1, 3	none	0
Select Character Spacing (SHS)	0, 1	2, 3	0
Select Graphic Rendition (SGR)	0, 1, 3-4, 9, 10-19, 21-24, 29	2, 5-7, 25-27	0
Select Line Spacing (SVS)	0, 1, 2, 3, 4	9	0
Selective Tabulation (STAB)	Any	none	no default
Spacing Increment (SPI)	Any positive value Any positive value	none none	current line spacing current line spacing
Start Reverse String (SRS)	0, 1	none	0

Control functions without parameters
Break Permitted Here (BPH)
Carriage Return (CR)
Line Feed (LF)
No Break Here (NBH)
Partial Line Down (PLD)
Partial Line Up (PLU)
Space (SP)
Substitute (SUB)

Code extension control functions

Any code extension control function defined in ISO 2022 is permitted. Interpretation and rendition of code extensions are implementation dependent.

7.7.1.2.4 Type of Coding

The value of this attribute is an ASN.1 object identifier as defined in ISO 8613 Part 6.

7.7.1.2.5 Coding Attributes

No coding attributes are defined for this content architecture level.

7.7.1.3 Character Formatted Processable

This character formatted processable content architecture level may be used in any basic object. Basic, non-basic and default values are specified in the following tables.

7.7.1.3.1 Presentation Attributes

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Alignment	start aligned end aligned centered justified	none	start aligned
Alignment Indicator	not aligned aligned	none	not aligned
Character Fonts	none	any	none
Character Orientation	0 degrees	90, 180, 270 degrees	0
Character Path	0, 90 degrees	180, 270 degrees	0
Character Spacing	100, 120 SMUs	Any other positive value	120 SMUs
First Line Format	1) indentation overhang overhang s-a item overhang e-a item 2) any non-negative value	none none	indentation 0
Graphic Character Sets	The graphic character sets of ISO 6937/2 + ISO 8859/1	Any other registered character sets	ISO 6937/2
Graphic Character Subrepertoire	Subrepertoire of ISO 6937/2 equivalent to ISO 8859/2 & suprepertoire of ISO 6937/2 equivalent to Teletex	Any other registered subrepertoire of ISO 6937/2	Subrepertoire of 6937/2 equivalent to ISO 8859/1
Graphic Rendition	0, 1, 3-4, 9, 10-19, 21-24, 29	2, 5-7, 25-27	0
Initial Offset	1) Any non-negative value 2) Any non-negative value	none none	0 120 SMUs

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Indentation	Any non-negative value	none	0
Kerning Offset	1) Any non-negative value	none	0
	2) Any non-negative value	none	0
Leading	yes, no	none	no
Line Layout Table	1) Any	none	no default
	2) Any	none	no default
	3) start-aligned end-aligned centered aligned-around	none	no default
	4) Any	none	no default
Line Progression	270 degrees	90 degrees	270 degrees
Line Spacing	100, 150, 200, 300, 400 SMUs	any other positive value	200 SMUs
Orphan Size	Any positive value	none	1
Pairwise Kerning	yes, no	none	no
Precision	1) Any positive value	none	1
	2) Any positive value	none	1
Widow Size	Any positive value	none	1

7.7.1.3.2 Content Elements

The graphic characters used by this content architecture level may be taken from any registered character set subject only to the restrictions defined in ISO 8613. The basic, non-basic, and default characters sets are defined by the presentation attribute "Graphic Character Sets" in 7.7.1.3.1.

7.7.1.3.3 Control Functions

Control functions with parameters

Control Functions	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Character Position Backward (HPB)	Any positive value	none	120 SMUs
Character Position Relative (HPR)	Any positive value	none	120 SMUs
Graphic Character Composition (GCC)	0, 1, 2	none	0
Identify Graphic Subrepertoire (IGS)	0	Any other registered subrepertoire of ISO 6937/2	no default
Line Position Backward (VPB)	Any positive value	none	100 SMUs
Line Position Relative (VPR)	Any positive value	none	100 SMUs
No Justify (JTF)	0	none	0
Parallel Texts (PTX)	0, 1, 3	none	0
Select Character Spacing (SHS)	0, 1	2, 3	0
Select Graphic Rendition (SGR)	0, 1, 3-4, 9, 10-19, 21-24, 29	2, 5-7, 25-27	0
Select Line Spacing (SVS)	0, 1, 2, 3,	4, 9	0
Selective Tabulation (STAB)	Any	none	no default
Set Space Width (SSW)	Any positive value	none	if variable spacing character "space", else 120 SMUs

Control Functions	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Spacing Increment (SPI)	Any positive value	none	current line spacing
	Any positive value	none	current line spacing
Start Reverse String (SRS)	0, 1	none	0

Control functions without parameters

Backspace (BS)
Break Permitted Here (BPH)
Carriage Return (CR)
Line Feed (LF)
No Break Here (NBH)
Partial Line Down (PLD)
Partial Line Up (PLU)
Space (SP)
Start of String (SOS)
String Terminator (ST)
Substitute (SUB)

Code extension control functions

Any code extension control function defined in ISO 2022 is permitted. Interpretation and rendition of code extensions are implementation dependent.

7.7.1.3.4 Type of Coding

The value of this attribute is an ASN.1 object identifier as defined in ISO 8613/6.

7.7.1.3.5 Coding Attributes

No coding attributes are defined for this content architecture level.

7.7.2 Raster Graphics Content Architecture

This section specifies the assignments of attribute values for the processable content architecture class. The values are listed in tabular form. There are basic, non-basic and default values listed for each attribute.

Content architecture level RP-1 is defined for the processable form content architecture class. Content pertaining to this level may be laid out using either the fixed dimension layout method or the scalable dimension layout method of the processable content layout process.

7.7.2.1 Raster Graphics Processable

RP-1 is a content architecture level derived from the processable form content architecture class. It is laid out using either the fixed or scalable dimension methods of the processable content layout process (depending upon the value of "pel spacing"). RP-1 content form may be associated with basic layout or logical objects.

7.7.2.1.1 Presentation Attributes

Attribute	Basic Value	Non-Basic Values	Default Values
Pel Path	0, 90, 180 270 deg	None	0 deg
Line Progression	90, 270 deg	None	270 deg
Pel spacing	(Any positive integer, Any positive integer) SMU, 'null'	None	(6,1)SMU
Spacing Ratio	(Any positive integer, Any positive integer)	None	(1,1)
Clipping		None	See note 1
First Pair	(Any non-negative integer, any non-negative integer)		
Second Pair	(Any non-negative integer, any non-negative integer)		
Image Dimensions	See note 2	None	Automatic
Image Width Set			
Minimum Width	Any non-negative integer	None	
Preferred Width	Any non-negative integer		
Image Height Set			
Minimum Height	Any non-negative integer	None	
Preferred Height	Any non-negative integer		
Image Size Set			
Minimum Height	Any non-negative integer	None	
Preferred Height	Any non-negative integer		
Minimum Width	Any non-negative integer	None	
Preferred Width	Any non-negative integer		
Aspect Ratio	Variable, fixed	None	
Automatic Set	-	-	

Note 1: The default value of 'clipping' is the first coordinate in the content portion (0,0) and the last coordinate (N-1, L-1), where N is the number of pels per line and L is the number of lines.

Note 2: Minimum values must not be greater than the preferred values.

7.7.2.1.2 Content Elements

Content is represented in a two-dimensional pictorial image in the form of a two-dimensional array of picture elements (pels). Each element of the array comprises data used to determine the image of the corresponding pel. Each element of the array is represented by data specifying one of two states. These two states are named "set" (1) and "unset" (0). The set state is used to represent the foreground color, with the unset state used to represent the background color.

7.7.2.1.3 Control Elements

No control elements are defined within the processable raster graphics content architecture.

7.7.2.1.4 Type of Coding

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Type of Coding	Bitmap encoding T6 encoding T4 encoding	none	Bitmap encoding

7.7.2.1.5 Coding Attributes

Attribute	Basic Value(s)	Non-Basic Value(s)	Default Value(s)
Number of Pels per Line	Any positive integer	None	No default
Number of lines	Any non-negative integer	None	No default
Pel Array Order	Up, Down see note 1	None	Down

Note 1: The attribute 'pel array order' is only relevant if the attribute 'type of encoding' takes the value of 'bitmap encoding'.

7.7.3 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 and etc. The content architecture is based on ISO 8632, Computer Graphics Metafile (CGM).

7.7.3.1 Geometric Graphics Formatted Processable

This section specifies the assignments of attribute values for the geometric graphics processable content architecture class, GG-0. The values are listed in a tabular form. There are basic, non-basic, and default values listed for each attribute.

7.7.3.1.1 Presentation Attributes

Attribute	Basic Values	Non-Basic Values	Default Values
VDC Type	0 (Integer) 1 (Real)	None	0
Integer Precision	16	8,24,32	16
Real Precision	0,9,23 (Floating Point) 1,16,16 (Fixed Point)	0,12,52 (Floating Point) 1,32,32 (Fixed Point)	0,9,23 Note 1
Index Precision	16	8,24,32	16
Color Precision	8,16	24,32	8
Color Index Precision	8,16	24,32	8
Maximum Color Index	255	All other permissible values	255
Color Value Extent	Any permissible values	None	(0,255)
Color Selection Mode	0 (Indirect) 1 (Direct)	None	0
VDC Integer Precision	16	24,32	16
VDC Real Precision	0,9,23 1,16,16	0,12,52 1,32,32	0,9,23 Note 1

Note 1: For "Real Precision", the first parameter designates the type : real. "0" implies fixed point. "1" implies floating point second parameter designates the bit precision of the exponent The third parameter designates the bit precision of the fract

Line Rendition

Attribute	Basic Values	Non-Basic Values	Default Values
Line Width Specification Model	0 (Absolute) 1 (Scaled)	None	1
Line Bundle Index	1-5	All other permissible values	1
Line Type	1 (Solid) 2 (Dash) 3 (Dot) 4 (Dash-dot) 5 (Dash-dot-dot)	All other permissible values	1
Line Width			
(If scaled)	Any permissible value	None	1.0
(If absolute)	Any permissible value	None	0.001* length of longest dimension of VDC Extent
Line Color			
(If indexed)	Any permissible value	None	1
(If direct)	Any permissible value	None	(255,255,255)
Line Aspect Source Flags			
Line Type	0 (Individual) 1 (Bundled)	None	0
Line Width	0 (Individual) 1 (Bundled)	None	0
Line Color	0 (Individual) 1 (Bundled)	None	0
Line Bundle Specifications			
Line Bundle Index	1-5	All other permissible values	1

Attribute	Basic Values	Non-Basic Values	Default Values
Line Bundle Representation			
Line Type	Note 1	All other permissible values	Note 1
Line Width	Note 1	All other permissible values	Note 1
Line Color	Note 1	All other permissible values	Note 1

Note 1: Values for Line Bundle Representation

	Bundle Index				
	1	2	3	4	5
Line Type	1 (Solid)	2 (Dash)	3 (Dot)	4 (Dash-dot)	5 (Dash-dot-dot)
Line Width					
(If scaled)	1.0	1.0	1.0	1.0	1.0
(If absolute)	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent
Line Color					
(If indexed)	1	1	1	1	1
(If direct)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)

Marker Rendition

Attribute	Basic Values	Non-Basic Values	Default Values
Marker Size Specification Mode	0 (Absolute) 1 (Scaled)	None	1
Marker Bundle Index	1-5	All other permissible values	1
Marker Type	1 (Dot) 2 (Plus) 3 (Asterisk) 4 (Circle) 5 (Cross)	All other permissible values	3
Marker Size			
(If scaled)	Any permissible value	None	1.0
(If absolute)	Any permissible value	None	0.001* length of longest dimension of VDC Extent
Marker Color			
(If indexed)	Any permissible value	None	1
(If direct)	Any permissible value	None	(255,255,255)
Marker Aspect Source Flags			
Marker Type	0 (Individual) 1 (Bundled)	None	0
Marker Size	0 (Individual) 1 (Bundled)	None	0
Marker Color	0 (Individual) 1 (Bundled)	None	0
Marker Bundle Specifications			
Marker Bundle Index	1-5	All other permissible values	1
Marker Bundle Representation			
Marker Type	Note 1	All other	Note 1

Attribute	Basic Values	Non-Basic Values	Default Values
		permissible values	
Marker Size	Note 1	All other permissible values	Note 1
Marker Color	Note 1	All other permissible values	Note 1

Note 1: Values for Marker Bundle Representation

	Bundle Index				
	1	2	3	4	5
Marker Type	1 (Dot)	2 (Plus)	3 (Asterisk)	4 (Circle)	5 (Cross)
Marker Size					
(If scaled)	1.0	1.0	1.0	1.0	1.0
(If absolute)	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent
Marker Color					
(If indexed)	1	1	1	1	1
(If direct)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255 255)

Text Rendition

Attribute	Basic Values	Non-Basic Values	Default Values
Font List	Note 1	All other permissible values	No default
Character Set List			
Character Set Type	0 (94 character) 1 (96 character)	All other permissible values	0
Designation Sequence Tail	Note 2	All other permissible values	Note 2
Character Coding Announcer	1 (Basic 8-bit)	All other permissible values	1
Text Bundle Index	1-2	All other permissible values	1
Text Font Index	1-4	All other permissible values	1
Text Precision	0 (String) 1 (Character) 2 (Stroke)	None	2
Character Expansion Factor	Any permissible values	None	1.0
Character Spacing	Any permissible values	None	0.0
Text Color			
(If indexed)	Any permissible values	None	1
(If direct)	Any permissible values	None	(255,255,255)
Character Height	Any permissible values	None	0.01 * length of the longest side of the VDC Extent

Attribute	Basic Values	Non-Basic Values	Default Values
Character Orientation	Note 3	All other permissible values	(0,1),(1,0)
Text Path	0 (Right) 1 (Left) 2 (Up) 3 (Down)	None	0
Text Alignment			
Horizontal	Note 4	4	0
Vertical	Note 5	6	0
Continuous horizontal	None	All other permissible values	No default
Continuous vertical	None	All other permissible values	No default
Character Set Index	1-2	All other permissible values	1
Alternate Character Set Index	1-2	All other permissible values	1
Text Aspect Source Flags			
Text Font	0 (Individual) 1 (Bundled)	None	0
Text Precision	0 (Individual) 1 (Bundled)	None	0
Character Expansion Factor	0 (Individual 1 (Bundled)	None	0
Character Spacing	0 (Individual) 1 (Bundled)	None	0
Text Color	0 (Individual) 1 (Bundled)	None	0
Text Bundle Specifications			
Text Bundle Index	1-2	All other permissible values	1

Attribute	Basic Values	Non-Basic Values	Default Values
Text Bundle Representation			
Text Bundle Index	Note 6	All other permissible values	Note 6
Text Precision	Note 6	All other permissible values	Note 6
Character Expansion Factor	Note 6	All other permissible values	Note 6
Character Spacing	Note 6	All other permissible values	Note 6
Text Color	Note 6	All other permissible values	Note 6

Note 1: List containing 1-4 fonts capable of representing the Subrepertoire of ISO 6937/2 equivalent to ISO 8859/1.

Note 2: Designation Sequence Tails that are registered for the character sets ISO 6937/2 and ISO 8859/1.

Note 3: Any pair of VDC vectors which have non-zero length, are not collinear and are parallel to the axis of the VDC Space.

Note 4: For Horizontal Alignment, a "0" implies "Normal Horizontal"; a "1" implies "Left"; a "2" implies "Center"; a "3" implies "Right"; a "4" implies "Continuous Horizontal".

Note 5: For Vertical Alignment, a "0" implies "Normal Vertical"; a "1" implies "Top"; a "2" implies "Cap"; a "3" implies "Half"; a "4" implies "Base"; a "5" implies "Bottom"; a "6" implies "Continuous Vertical".

Note 6: Values for the Text Bundle Representation:

	Bundle Index 1	2
Font Index	1	2
Text Precision	Stroke	Stroke
Character Expansion Factor	1.0	0.5
Character Spacing	0.0	0.0
Text Color		

(If indexed)	1	1
(If direct)	(255,255,255)	(255,255,255)

Filled Area Rendition

Attribute	Basic Value	Non-Basic Values	Default Values
Fill Bundle Index	1-5	All other permissible values	1
Interior Style	1 (Hollow) 2 (Solid) 3 (Pattern) 4 (Hatch) 5 (Empty)	All other permissible values	1
Fill Color			
(If indexed)	Any permissible values	None	1
(If direct)	Any permissible values	None	(255,255,255)
Hatch Index	1-6	All other permissible values	1
Pattern Index	1-8	All other permissible values	1
Fill Reference values	Any permissible	None	(0,0)
Pattern Size			
Height Vector			
X component	Any permissible values	None	0
Y component	Any permissible values	None	Height of default VDC extent
Width Vector			
X component	Any permissible values	None	Width of default VDC extent Y Y
component	Any permissible values	None	0

Attribute	Basic Value	Non-Basic Values	Default Values
Pattern Table Specifications			
Pattern Table Index	1-8	All other permissible values	1-8
Nx	1-16	All other permissible values	1
Ny	1-16	All other permissible values	1
Local color	0,1,8,16	All other	0
precision		permissible values	
Color			
(If indexed)	Any permissible values	None	1
(If direct)	Any permissible values	None	(255,255,255)
Fill Aspect Source Flags			
Interior Style	0 (Individual) 1 (Bundled)	None	0
Fill Color	0 (Individual) 1 (Bundled)	None	0
Hatch Index	0 (Individual) 1 (Bundled)	None	0
Pattern Index	0 (Individual) 1 (Bundled)	None	0
Fill Bundle Specifications			
Fill Bundle Index	1-5	All other permissible values	1
Fill Bundle Representation			
Interior Style	Note 1	All other permissible values	Note 1
Fill Color	Note 1	All other permissible values	Note 1
Hatch Index	Note 1	All other permissible values	Note 1
Pattern Index	Note 1	All other permissible values	Note 1

Note 1: Values for Fill Bundle Representation

	Bundle Index				
	1	2	3	4	5
Interior Style	4 (Hatch)	4 (Hatch)	4 (Hatch)	4 (Hatch)	4 (Hatch)
Fill Color					
(If indexed)	1	1	1	1	1
(If direct)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255 255)
Hatch Index	1	2	3	4	5
Pattern Index	1	1	1	1	1

Edge Rendition

Attribute	Basic Values	Non-Basic Values	Default Values
Edge Width Specification Mode	0 (Absolute) 1 (Scaled)	None	1
Edge Bundle Index	1-5	All other permissible values	1
Edge Type	1 (Solid) 2 (Dash) 3 (Dot) 4 (Dash-dot) 5 (Dash-dot-dot)	All other permissible values	1
Edge Width			
(If scaled)	Any permissible value	None	1.0
(If absolute)	Any permissible value	None	0.001* length of longest dimension of VDC Extent
Edge Color			
(If indexed)	Any permissible value	None	1
(If direct)	Any permissible value	None	(255,255,255)
Edge Aspect Source Flags			
Edge Type	0 (Individual) 1 (Bundled)	None	0
Edge Width	0 (Individual) 1 (Bundled)	None	0
Edge Color	0 (Individual) 1 (Bundled)	None	0
Edge Bundle Specifications			
Edge Bundle Index	1-5	All other permissible values	1

Attribute	Basic Values	Non-Basic Values	Default Values
Edge Bundle Representation			
Edge Type	Note 1	All other permissible values	Note 1
Edge Width	Note 1	All other permissible values	Note 1
Edge Color	Note 1	All other permissible values	Note 1

Note 1: Values for Edge Bundle Representation

	Bundle Index				
	1	2	3	4	5
Edge Type	1 (Solid)	2 (Dash)	3 (Dot)	4 (Dash-dot)	5 (Dash-dot-dot)
Edge Width					
(If scaled)	1.0	1.0	1.0	1.0	1.0
(If absolute)	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent	0.001 x length of largest dimension of VDC Extent
Edge Color					
(If indexed)	1	1	1	1	1
(If direct)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)	(255,255, 255)

Color Representation

Attribute	Basic Value	Non-Basic Values	Default Values
Background Color	Any permissible values	None	(0,0,0)
Color Table Specifications			
Starting Index	Any permissible values	None	2
Color List	Any permissible values	None	Note 1

Note: The default Color Table indices 0 and 1 are explicitly defined in ISO 8632 as corresponding to the nominal background and nominal foreground colors, respectively. The following eight (8) direct color values are repeated to fill the remaining 254 entries of the color list. (1,0,0), Red; (0,1,0), Green; (0,0,1), Blue; (1,1,0),Yellow; (1,0,1), Magenta; (0,1,1), Cyan; (0,0,0), Black; (1,1,1), White.

Transparency Specification

Attribute	Basic Value	Non-Basic Values	Default Values
Transparency	0 (On) 1 (Off)	None	0
Auxiliary Color			
(If indexed)	Any permissible values	None	0
(If direct)	Any permissible values	None	(0,0,0)

Transformation Specification

Attribute	Basic Value	Non-Basic Values	Default Values
VDC Extent	Note 1	None	(32767, 32767)
Clip Indicator	0 (On) 1 (Off)	None	0
Clip Rectangle	Note 1	None	(32767, 32767)

Note 1: Any pair of Virtual Device Coordinates defining a rectangle.

Other Presentation Attributes

Attribute	Basic Value	Non-Basic Values	Default Values
Region of Interest	Automatic, Rectangle	None	Automatic
Picture Orientation	0,90,180,270	None	0

7.7.3.1.2 Content Elements

The value of the content portion attribute "content information" of a content portion description that conforms to ISO 8613-8 is an ASN.1 octet string representing a CGM metafile conforming to the rules defined in ISO 8632-1 with the encoding defined in ISO 8632-3.

7.7.3.1.3 Control Functions

No other control functions are defined for content portions conforming to ISO 8613-8 other than those control functions defined in ISO 8632-1 and ISO 8632-3.

7.7.3.1.4 Type of Coding

This attribute is not applicable to this document application profile.

7.7.3.1.5 Coding Attributes

No other coding attributes are defined for content portions conforming to ISO 8613-8 values.

7.8 Document Profile

Attributes that are not required or permitted cannot be used. In the tables, "any value" means any value specified in Part 4 of DIS 8613.

7.8.1 Presence of Document Constituents

Permitted Attributes

Attribute Name	Value Description
Resource Document	-- any value
Resources	-- any value
Generic Layout Structure	-- any value
Specific Layout Structure	-- any value
Generic Logical Structure	-- any value
Specific Logical Structure	-- any value
Layout Styles	-- any value
Presentation Styles	-- any value
External Document Class	-- any value

7.8.2 Document Characteristics

Required Attributes

Attribute Name	Value Description
Document Application Profile	-- object identifier to be supplied
Document Application Profile Defaults	-- any value
Document Architecture Class	-- any value
Content Architecture Class	-- any value
ODA Version	-- any value

7.8.2.1 Non-basic Document Characteristics

The following attributes are required when non-basic values are associated with attributes of the document.

Attribute Name	Value Description
Profile Character Sets	Note 1
Comments Character Sets	Note 1
Alternative Representation Character Sets	Note 1
Page Dimensions	-- any value
Medium Types	-- any value
Layout Path	-- any value
Layout Texture	-- any value
Protection	-- any value
Block Alignment	-- any value
Fill Order	-- any value
Coding Attributes	-- any value
Presentation Attributes	-- any value
Unit Scaling	-- any value
Fonts List	-- any value

Note 1: The default value is the minimum subrepertoire of ISO 6937/2. The only permissible values are ISO 6937/2 and ISO 8859/1.

7.8.3 Document Management Attributes

Required Attributes

Attribute Name	Value Description
Title	-- any value

Permitted Attributes

Attribute Name	Value Description
Subject	-- any value
Document Type	-- any value
Abstract	-- any value
Document Date and Time	-- any value
Creation Date and Time	-- any value
Local Filing Date and Time	-- any value
Expiry Date and Time	-- any value
Start Date and Time	-- any value
Purge Date and Time	-- any value
Release Date and Time	-- any value
Revision History	-- any value
Organizations	-- any value
Preparers	-- any value

Owners	--	any value
Authors	--	any value
Copyright Information	--	any value
Copyright Dates	--	any value
Status	--	any value
User Specific Codes	--	any value
Distribution List	--	any value
References to Other Documents	--	any value
Superseded Documents	--	any value
Keywords	--	any value
Document Reference	--	any value
Local File Reference	--	any value
Document Size	--	any value
Number of Pages	--	any value
Languages	--	any value
Authorization	--	any value
Security Classification	--	any value
Access Rights	--	any value
Encryption Indicator	--	any value
Password	--	any value
Additional Information	--	any value

7.9 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.

7.9.1 Data Stream

The data stream rules are according to the Interchange Format Class A, as defined in clause 4 of ISO 8613-5.

7.9.2 Interchange Data Unit Ordering

The order of interchange data units composing a document data stream must appear, when present, in the same order as that shown in Table 7.9-1, from top to bottom. For example, a Layout Object Class Descriptor interchange data unit, when present, must follow the Document Profile Descriptor interchange data unit and precede all other interchange data unit types.

Table 7.9 Order of Interchange Data Units

Interchange Data Unit	Order
Document Profile Descriptor	1
Layout Object Class Descriptors	2
Logical Object Class Descriptors	3
Text Units Representing Generic Content Portions	4
Presentation Style Descriptors	5
Layout Style Descriptors	6
Layout Object Descriptors	7
Logical Object Descriptors	8
Text Units Representing Specific Content Portions	9

7.9.3 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.

7.9.3.1 ASN.1 Generation Requirements

There are no additional requirements, beyond ISO 8824 and ISO 8825, imposed on the ASN.1 generation.

7.9.3.2 ASN.1 Parsing Requirements

There are no additional requirements, beyond ISO 8824 and ISO 8825, imposed on the ASN.1 parsing. The treatment of ASN.1 syntax and semantic violations is at the discretion of the implementation.

7.9.3.3 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.

7.9.3.3.1 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
04_{16}	07_{16}	$432E436F6D6273_{16}$

The same value may be encoded in the constructed from as:

Octet String	Length	Contents
24_{16}	80_{16}	

Octet String	Length	Contents
04_{16}	02_{16}	$432E_{16}$
04_{16}	05_{16}	$436F6D6273_{16}$
EOC	Length	
00_{16}	00_{16}	

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
24_{16}	80_{16}	

Octet String	Length	Contents
24_{16}	04_{16}	

Octet String	Length	Contents
04_{16}	02_{16}	$432E_{16}$
04_{16}	05_{16}	$436F6D6273_{16}$
EOC	Length	
00_{16}	00_{16}	

7.9.3.3.2 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 00000001_2 or in the long form as 10000001_2 00000001_2. 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.

7.9.3.3.3 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.

7.9.3.4 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.

7.9.3.4.1 Segmented Strings

The ASN.1 generation restriction on segmenting strings (7.9.3.3.1) 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.

7.10 Relationship to Other DAPs

7.10.1 SPAG

There are three Document Application Profiles (DAPs) being defined by the European Standards Promotion and Applications Group (SPAG). These are called Q/111, Q/112, and Q/113.

Q/111 and Q/112 are consistent with the NBS DAP but have limits on the attributes, particularly for logical objects, layout objects, and content types. However, even with these restrictions, Q/111 and Q/112 data streams will be subsets of the NBS DAP data streams and Q/113 is expected to be a functional equivalent to the NBS DAP.

7.10.2 CCITT

Several activities in CCITT Study Group VIII will result in application profiles being published as 1988 Recommendations. Some of this work is contained in the drafts of new and revised Recommendations, e.g., the T.400 series.

7.10.3 TOP

This NBS DAP will be presented to TOP as a suggested replacement for the TOP Version 3.0 ODA Application Profile.

7.10.4 POSI

A request for liaison has been made to POSI in order to identify Japanese-defined DAPs.

8. PERFORMANCE

To be completed.

9. REFERENCES

Selected references are grouped by organization publishing the documents and by Reference Model layer to aid the reader in relating standards to the OSI Basic Reference Model and to aid relating equivalent standards published by different standards organizations.

9.1 CCITT: Consultative Committee for International Telegraph and Telephone

Network Layer

CCITT Recommendation X.25 - 1984, Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode on Public Data Networks.

Transport Layer

CCITT Recommendation X.214, (Red Book, 1984), Transport Service Definition for Open Systems Interconnection for CCITT Applications.

CCITT Recommendation X.224, (Red Book, 1984), Transport Protocol Profile for Open Systems Interconnection for CCITT Applications.

Session Layer

CCITT Recommendation X.215, (Red Book, 1984), Session Service Definition for Open Systems Interconnection for CCITT Applications.

CCITT Recommendation X.225, (Red Book, 1984), Session Protocol Profile for Open Systems Interconnection for CCITT Applications.

Application Layer -- MHS

CCITT Recommendation X.400, (Red Book, 1984), Message Handling Systems: System Model-Service Elements.

CCITT Recommendation X.401, (Red Book, 1984), Message Handling Systems: Basic Service Elements and Optional User Facilities.

CCITT Recommendation X.408, (Red Book, 1984), Message Handling Systems: Encoded Information Type Conversion Rules.

CCITT Recommendation X.409, (Red Book, 1984), Message Handling Systems: Presentation Transfer Syntax and Notation.

CCITT Recommendation X.410, (Red Book, 1984), Message Handling Systems: Remote Operations and Reliable Transfer Server.

CCITT Recommendation X.411, (Red Book, 1984), Message Handling Systems:

Message Transfer Layer.

CCITT Recommendation X.420, (Red Book, 1984), Message Handling Systems: Interpersonal Messaging User Agent Layer.

CCITT Recommendation X.430, (Red Book, 1984), Message Handling Systems: Access Protocol for Teletex Terminals.

CCITT documents may be obtained from:

International Telecommunications Union
Place des Nations, CH 1211,
Geneva 20 SWITZERLAND

9.2 EIA: Electronic Industries Association

Physical Layer

Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange, EIA-232D.

Application Layer

Manufacturing Messaging Service for Bi-directional Transfer of Digitally Encoded Information, Part 1: Service Specification, RS 511, 1986.

Manufacturing Messaging Service for Bi-directional Transfer of Digitally Encoded Information,Part 2: Protocol Specification, RS 511, 1986.

9.3 IEEE: Institute of Electrical and Electronic Engineers, Inc.

Physical Layer

IEEE Standard for Local Area Networks: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) and Physical Layer Specification, ANSI/IEEE Standard 802.3 1985, Institute of Electrical and Electronics Engineers, 345 East 47th St., New York, NY. 10017, 1985.

IEEE Standard for Local Area Networks: Token-Passing Bus Access Method and Physical Layer Specification, ANSI/IEEE Standard 802.4 - 1985, Institute of Electrical and Electronics Engineers, 345 East 47th St., New York, NY. 10017, 1985.

IEEE Standard for Local Area Networks: Token-Ring Access Method,

ANSI/IEEE Standard 802.5-1985, Institute of Electrical and Electronics Engineers, 345 East 47th St., New York, NY. 10017, 1985.

Data Link Layer

IEEE Standard for Local Area Networks: Logical Link Control, ANSI/IEEE Standard 802.2 - 1985, Institute of Electrical and Electronics Engineers, 345 East 47th St., New York, NY. 10017, 1985.

9.4 ISA: Instrumentation Society of America

Instrumentation Society of America: Proway-LAN, ISA-S72.01, 1985.

Proposed Instrumentation Society of America Standard: Process Control Architecture, dS S72.03, 1987.

9.5 ISO: International Organization for Standardization

Status of ISO work can be determined by the reference number; working drafts are referenced by committee and number; e.g., TC 97/SC 6 Nxxxx. Standards are cited by either ISO xxxx or IS xxxx; DIS and DPs are cited in similar form.

Information Processing Systems - Open Systems Interconnection - Basic Reference Model. ISO/IS 7498. First Edition - Oct. 15, 1984. Ref. No. ISO 7498-1984(E).

OSI Basic Reference Model - Part 2: Security Architecture. ISO/TC 97/SC 21/N1528. Project 97.21.18. September 1986.

OSI Basic Reference Model - Part 3: Naming and Addressing. ISO/DIS 7498-3, ISO/TC 97/ SC 21 N2141. May, 1987.

Data Interchange - Structure for the identification of organizations. ISO 6523. 1984-02-01.

Data Link Layer

Information Processing Systems - Data Communications - High-Level Data Link Control Procedures - Description of the X.25 LAPB-compatible DTE Data Link Procedures, IS 7776.

Network Layer

Information Processing Systems - Open Systems Interconnection - Network Service Definition, IS 8348.

Information Processing Systems - Open Systems Interconnection - Addendum to the Network Service Definition Covering Connectionless Data Transmission, IS 8348/AD1.

Information Processing Systems - Open Systems Interconnection - Addendum to the Network Service Definition Covering Network Layer Addressing, IS 8348/AD2.

Information Processing Systems - Open Systems Intergonnection - Internal Organization of the Network Layer, DIS 8648.

Information Processing Systems - Open Systems Interconnection - Protocol for Providing the Connectionless Network Service, IS 8473.

Information Processing Systems - Open Systems Interconnection -Addendumto IS 8473 - Provision of the Underlying Service Assumed by ISO 8473, ISO TC 97/SC 6 N 3453.

Information Processing Systems - Open Systems Interconnection, Working Draft, End System to Intermediate System Routing Exchange Protocol for use in Conjunction with ISO 8473 ISO TC 97/SC 6 N 4053.

Information Processing Systems - Open Systems Interconnection - Data Communication - X.25 Packet Level Protocol for Data Terminal Equipment, IS 8208.

Transport Layer

Information Processing Systems - Open Systems Interconnection - Transport Service Definition, IS 8072.

Information Processing Systems - Open Systems Interconnection - Transport Protocol Profile, IS 8073, 1984.

Session Layer

Information Processing Systems - Open Systems Interconnection - Basic Connection Oriented Session Service Definition, IS 8326 August 15, 1987.

Information Processing Systems - Open Systems Interconnection - Basic Connection Oriented Session Protocol Profile, IS 8327. August 15, 1987.

Information Processing Systems - OSI - Basic Oriented Session Service Definition - DAD 2 to ISO 8326 to Incorporate Unlimited User Data, ISO/IS 8326. Aug. 27, 1987.

Information Processing Systems - OSI - Basic Oriented Session Service Protocol - DAD 2 to ISO 8327 to Incorporate Unlimited User Data, ISO/IS 8327. Aug. 27, 1987.

Presentation Layer

Information Processing Systems - Open Systems Interconnection - Connection-Oriented Presentation Service Definition, DIS 8822 - Revision C.

Information Processing Systems - Open Systems Interconnection - Connection-Oriented Presentation Protocol Profile, DIS 8823 - Revision C.

Information Processing Systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1). ISO 8824 - 1987-05-19.

Information Processing Systems - Open Systems Interconnection - Specification of Basic Encoding Rules for Abstract Syntax Notation (ASN.1), ISO/DIS 8825 - 1987-05-19.

7-bit Coded Character Set for Information Processing Interchange, ISO-646.

Information Interchange - Representation of Local Time Differentials, ISO-3307.

Application Layer

Application Layer Structure, ISO/DP 9545, ISO/TC97/SC21/N1743. July 24, 1987.

Application Layer -- FTAM

Information Processing Systems - Open Systems Interconnection - File Transfer, Access and Management Part I: General Introduction, DIS 8571/1.

Information Processing Systems - Open Systems Interconnection - File Transfer, Access and Management Part II: The Virtual Filestore, DIS 8571/2.

Information Processing Systems - Open Systems Interconnection - File Transfer, Access and Management Part III: File Service Definition, DIS 8571/3.

Information Processing Systems - Open Systems Interconnection - File Transfer, Access and Management Part IV: File Protocol, Profile, DIS 8571/4.

Application Layer -- ASE/CASE

Information Processing Systems - Open Systems Interconnection - Service Definition for Common Application Service Elements - Part 2: Association Control ACSE Editor's Draft #2, 8/27/87.

Information Processing Systems - Open Systems Interconnection - Protocol Profile for Common Service Elements - Part 2: Association Control, ACSE

Editor's IS review d #2, 8/27/87.

Application Layer -- VTP

Information Processing Systems - Open Systems Interconnection - Virtual Terminal Service - Basic Class, IS 9040.

Information Processing Systems - Open Systems Interconnection - Virtual Terminal Protocol - Basic Class, IS 9041.

Application Process -- Office Document Interchange -- ODA/ODIF

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 1; General Information, DIS 8613/1.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 2; Document Structures, DIS 8613/2.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 3; Document Processing Reference Model, DIS 8613/3.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 4; Document Profile, DIS 8613/4.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 5; Office Document Interchange Format, DIS 8613/5.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 6; Character Content Architecture, DIS 8613/6.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 7; Raster Graphics Content Architecture, DP 8316/7.

Information Processing Systems - Text and Office Systems - Office Document Architecture (ODA) and Interchange Format - Part 8; Geometric Graphics Content Architecture, DP 8613/8.

Information Processing Systems - Text and Office Systems - Standard Generalized Markup Language (SGML), IS 8879.

Application Process -- Computer Graphics -- CGM/GKS

Information Processing Systems - Computer Graphics - Metafile (CGM) for the Storage and Transfer of Picture Description Information, Part 1; Functional Specification, IS 8632/1

Information Processing Systems - Computer Graphics - Metafile (CGM) for the Storage and Transfer of Picture Description Information, Part 2; Character Encoding, IS 8632/2

Information Processing Systems - Computer Graphics - Metafile (CGM) for the Storage and Transfer of Picture Description Information, Part 3; Binary Encoding, IS 8632/3.

Information Processing Systems - Computer Graphics - Metafile (CGM) for the Storage and Transfer of Picture Description Information, Part 4; Clear Text Encoding, IS 8632/4.

Information Processing Systems - Font and Character Information Interchange, IS 9541.

Information Processing Systems - 8-Bit Single Byte Coded Graphic Character Sets, Part 1; Latin Alphabet Part 1, IS 8859/1.

Information Processing Systems - Computer Graphics Functional Specification of the Graphical Kernel System (GKS), IS 7942.

Information Processing Systems - Computer Graphics - Graphical Kernel System for Three Dimensions (GKS-3D), Functional Description, DIS 8805.

Information Processing Systems - Computer Graphics - Programmers Hierarchical Interactive Graphics System (PHIGS), DP 9592.

Information Processing Systems - Computer Graphics - Interfacing Techniques for Dialogues with Graphical Devices (CGI),ISO TC 97/SC 21 N 1179.

ISO documents may be obtained from:

Frances E. Schrotter
ANSI
ISO TC 97/SC 6 Secretariat
1430 Broadway
New York, NY. 10018

9.6 MAP

Manufacturing Automation Protocol, General Motors Corporation,Manufacturing Engineering and Development, Advanced Product and Manufacturing Engineering Staff (APMES), APMES A/MD-39, GM Technical Center, Warren, MI. 48090-9040.

9.7 NBS: National Bureau of Standards

Local Area Networks: Baseband Carrier Sense Multiple Access with Collision Detection Access Method and Physical Layer Profiles and Link Layer Protocol, FIPS 107, NTIS, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA. 22161.

Interface Between Data Terminal Equipment (DTE) and DataCircuit-Terminating Equipment (DCE) For Operation With Packet-Switched Data Communications Networks, FIPS 100, NTIS, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA. 22161.

Implementation Agreements for Open Systems Interconnection Protocols: NBS Workshop for Implementors of Open Systems Interconnection, National Bureau of Standards, NBSIR 86-3385-6, Robert Rosenthal, Editor, Revised July 1987.

Implementation Agreements Among Participants of OSINET, National Bureau of Standards, Institute for Computer Sciences and Technology, NBSIR 86-3478, 1987.

U. S. Government Open Systems Interconnection Profile (GOSIP), National Bureau of Standards, Institute for Computer Sciences and Technology, 1987.

NBS documents may be obtained from:

NTIS
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA. 22161.
or
National Bureau of Standards
Institute for Computer Sciences and Technology
Gaithersburg, MD. 20899

9.8 NCS: National Communications System

Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) For Operation With Packet-Switched Data Communications Networks, National Communications System, Federal Standard FED-STD 1041.

9.9 TOP

Technical and Office Protocols, Boeing Computer Services, Network Services Group, P.O. Box 24346, M/S7C-16, Seattle, WA. 98124-0346.

NBS-114A (REV. 2-8C)

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11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)

This document records current agreements on implementation details of Open System 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 (every four months)

12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)

local area networks; NBS/OSI Workshop; network protocols; Open Systems Interconnection; OSINET; testing protocols

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