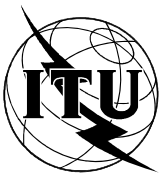

INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

T.501

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SERIES T: TERMINAL EQUIPMENT AND PROTOCOLS FOR TELEMATIC SERVICES

A DOCUMENT APPLICATION PROFILE MM FOR THE INTERCHANGE OF FORMATTED MIXED MODE DOCUMENT

Reedition of CCITT Recommendation T.501 published in the Blue Book, Fascicle VII.7 (1988)

NOTES

1 CCITT Recommendation T.501 was published in Fascicle VII.7 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation T.501

A DOCUMENT APPLICATION PROFILE MM FOR THE INTERCHANGE OF FORMATED MIXED MODE DOCUMENT

1 Scope

1.1 This Recommendation defines a document application profile conforming to the T.410 Series of Recommendations.

Its purpose is to specify an interchange format suitable for the interchange of mixed mode documents such as memoranda, letters and reports that contain characters and raster graphics.

Documents are interchanged only in a formatted form which enables the recipient to only display or print the document as intended by the originator.

1.2 The features which can be interchanged using this document application profile fall into the following categories:

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

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

c) character repertoire – these concern the character sets and control functions that make up the document character content;

d) raster graphics coding – these concern the raster graphics representations and control functions that make up the document raster graphics content.

2 Field of application

2.1 This Recommendation defines a document application profile that is in conformance with the T.410 Series of Recommendations and that allows mixed mode documents to be interchanged only in a formatted form, which allows a recipient to reproduce the document as intended by the originator.

2.2 This recommendation defines a document application profile that may be used by any telematic service.

2.3 This document application profile is designed to be independent of the means used to create or to interchange the encoded documents.

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

3 References

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

– T.400 Series of Recommendation: “Document architecture, transfer and manipulation”.

– Rec. T.6: “Facsimile coding schemes and coding control functions for group 4 facsimile apparatus”.

– Rec. T.61: “Character repertoire and coded character sets for the international teletex service”.

– Rec. X.208: “Specification of abstract syntax notation one (ASN.1) ”.

– Rec. X.209: “Specification of basic encoding rules for abstract syntax notation one (ASN.1) ”.

– ISO 6937: “Information processing – coded character sets for text communication".

4 Definitions

The definitions in Recommendation T.411 apply to this Recommendation.

5 Characteristics supported by this document application profile

5.1 *Overview*

A mixed mode document is the result of a formatting process and therefore the purpose of this document application profile is to allow transfer of the complete layout of the interchanged document.

Furthermore, two categories of content are allowed within the same page, namely:

– a character content as used by word processing machines (e.g. basic teletex equipment);

– a raster graphics content as used by facsimile group 4 apparatus.

This section specifies the functional description of the features supported by this document application profile.

5.2 *Logical characteristics*

Not applicable.

5.3 *Layout characteristics*

5.3.1 *The document layout structure*

A document is seen as a succession of pages.

The content of a page may be:

– character content; or

– raster graphics content; or

– both of them.

When different content types are used within the same page, this page must be composed of several blocks.

Each block has a homogeneous content.

5.3.2 *Page layout characteristics*

5.3.2.1 *The text area*

The text area is the area made available for the positioning and display of the document content. The dimensions of the text area must be equal to or smaller than the dimensions of the nominal page corresponding to the paper format used.

The possible paper formats are defined in Recommendation T.561.

Only the vertical orientation of the page is permitted.

5.3.2.2 *Block*

5.3.2.2.1 *Position and dimension*

Each block is positioned in the page and has its own dimensions (independently of the other blocks). Figure 1/T.501 gives an example of a page.

3.3 *First application example: THE MIXED MODE*

This is the possibility of mixing various coding types (characters, pels, geometric primitives, etc.) on the same page of a document. The document architecture is thus used to mark out physical areas (blocks) and associates contents with it so as to reproduce the initial image of the page.

The CCITT has, during its last study period, standardized the "mixed mode" application for teletex terminals and group 4 facsimile equipments. This application, described in Recommendation T.72 , only allows at present the mixture of characters and photographic images (facsimile encoded information).

Figure 10 illustrates the mixed mode application in the form of a layout tree with which leaves of different natures are associated. It is as yet too early to know horticulturists' or agronomists' impressions about this surprising property which electronics can now offer!!!

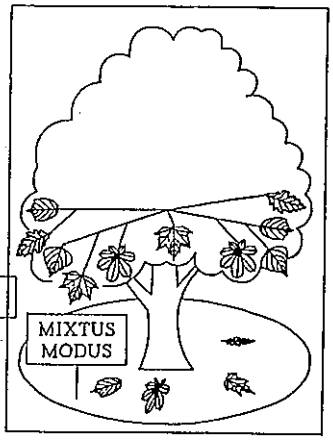

Figure 10: The mixed mode

FIGURE 1/T.501

An example of a page

5.3.2.2.2 *Overlay*

Within a page, blocks may be positioned in such a way that they intersect partially or fully, i.e. they share common areas.

All blocks are "transparent", that means that the contents of the intersecting areas are combined.

5.4 *Document layout features*

Not applicable.

5.5 *Content layout and imaging characteristics*

5.5.1 *The mixed mode document may contain blocks with characters in teletex format and blocks with raster graphics in facsimile group 4 format.*

The characteristics of the content of a block, such as the line spacing or the character path, are independent of those of other blocks.

All the characteristics cannot be altered anywhere within a block.

5.5.2 *Character content block*

5.5.2.1 *General*

The character content blocks contain graphic characters and control functions. The control functions define format effectors such as space or carriage return.

5.5.2.2 *Line spacing*

This property specifies the distance between successive lines of text.

The basic values are:

SMU	Lines per 25.4 mm (when the scaling factor is one)
200 (by default)	6 (by default)
400	3
300	4
100	12

The negotiable value is 150 SMU which correspond to 8 lines per 25.4 mm when the scaling factor is one.

5.5.2.3 *Character spacing*

This specifies the distance between successive characters on a line of text.

The basic value is 120 SMU which correspond to 10 characters per 25.4 mm when the scaling factor is one.

The negotiable values are:

SMU	Characters 25.4 mm (when the scaling factor is one)
200	6
100	12
80	15

5.5.2.4 *Character path*

This specifies that direction of progression of successive characters along a line of characters.

The basic values are 0^{o} (by default) and 90^{o}.

The negotiable value is 270^{o}.

The mentioned values are measured anti-clockwise.

5.5.2.5 *Emphasis*

This specifies the presentation of the characters. Four modes are available: normal rendition (by default), underlined, italicized and bold.

5.5.2.6 *First character position*

The position of the first character, that may be a space, is defined by cartesian coordinates.

5.5.3 *Raster graphics content block*

5.5.3.1 *General*

The content of blocks of raster graphics is defined by the initial offset (by default, the left top corner) and the dimensions of the array of pixels.

5.5.3.2 *Pel transmission density*

The basic values are:

SMU	Pels per 25.4 mm (when the scaling factor is one)
5	240
4	300

The negotiable values are:

SMU	Pels per 25.4 mm (when the scaling factor is one)
6	200
3	400
2	600
1	1200

5.5.4 *Received document*

This document application profile, being limited to formatted form, does not support any features to facilitate processing of an interchanged document by a receiver.

6 Specification of the document application profile

6.1 *Summary of the technical specification*

6.1.1 *Overview*

This section contains the technical specification of the document application profile MM.1. This is in accordance with Recommendation T.411.

MM.1 allows documents to be represented in the formatted form, which allows a recipient to reproduce the document as intended by the originator.

6.1.2 *Specification of constituents*

This section specifies the required and optional constituents used for the representation of documents that conform to MM.1. Also, it specifies the content architectures that may be present in these documents.

Constituents specified as “required” must occur in any document that conforms with MM.1. Constituents listed as “optional” may or may not be present in the document depending upon the requirements of the particular document. The document profile indicates which constituents are present in the document.

6.1.2.1 *Required constituents*

– a document profile as specified in § 6.5;

– layout object descriptions representing a specific layout structure as defined in § 6.3.2.

6.1.2.2 *Optional constituents*

– layout object class descriptions representing a “partial” generic layout structure as defined in § 6.3.1.

6.1.3 *Interchange format class*

The interchange format class used in this document application profile is “A”, as defined in Recommendation T.415.

6.1.4 *Object identifiers*

The ASN.1 object identifier value to designate the document application profile MM.1 is:

{0020 501 0}

6.2 *Logical structure*

Not applicable.

6.3 *Layout structure*

6.3.1 *The generic layout structure*

The generic layout structure is a "partial" structure and its purpose is to provide for factorization. That is, the "partial" generic layout structure provides for predefined attributes values and content portions for objects in the specific layout structure.

The generic layout structure may contain three types of object classes, namely the document layout root class, the page class and the block class. All are optional.

6.3.2 *The specific layout structure*

The number of hierarchical levels allowed is 3, namely:

– document layout root;

– page;

– block.

The three levels are mandatory. If the content portions are not directly associated with each block, then the content portions must be derived from a referenced object class of type block.

6.3.3 *Attributes of layout components*

6.3.3.1 *Application and classification of attribute for layout component descriptions*

The attributes application for MM are defined in Table 1/T.501. The following notation is used in this table:

The form .../... represents:

object class description/object description

where ... is replaced by:

--- attribute not applicable to either object class or object description;

-- attribute not applicable;

m mandatory attribute;

nm non-mandatory attribute;

d defaultable attribute.

Capital letters (M, NM and D) are used for groups of attributes.

TABLE 1/T.501

Attributes application and classification

Attribute	Document layout root	Page	Block
Shared attributes			
Object type	m/m	m/m	m/m
Object identifier	--/m	--/m	--/m
Object class identifier	m/--	m/--	m/--
Generator for subordinates	---	---	---
Object class	--/nm	--/nm	--/nm
Subordinates	--/m	--/m	--/--
Resource	---	---	---
Presentation style	---	---	---
Presentation attributes	---	---	nm/d
User visible name	---	---	---
Bindings	---	---	---
Content portions	---	---	nm/nm
User readable comments	nm/d	nm/d	nm/d
Default value lists	nm/nm	nm/nm	---
Layout attributes			
Dimensions	---	nm/d	nm/d
Position	---	nm/d	nm/d
Layout texture	---	---	---
Border	---	---	---
Balance	---	---	---
Layout path	---	---	---
Logical source	---	---	---
Permitted category	---	---	---
Imaging order	---	---	---
Page position	---	---	---
Medium type	---	---	---

6.3.3.2 *Specification of attributes for layout object class descriptions (see Table 2/T.501)*

TABLE 2/T.501

Attribute values for layout object class descriptions

Attribute	Basic value	Non-basic value
Shared attributes		
Object type	document layout root, page, block	none
Object class identifier	as defined in Rec. T.412 (see also Annex A)	none
Content portions	as defined in Rec. T.412	none
Default value lists	see Table 4/T.501	none
Presentation attributes	see Table 5/T.501	
Dimensions	horizontal ≤ 9920 SMU vertical ≤ 14030 SMU	North-American ≤ (10200, 13200) ISO A3 ≤ (14030, 19840) Japanese legal ≤ (12141, 17196) Japanese letter ≤ (8598, 12141)
Position	horizontal = any non-negative integer vertical = any non-negative integer	

6.3.3.3 *Specification of attributes for layout object class descriptions (see Table 3/T.501)*

TABLE 3/T.501

Attribute values for layout object descriptions

Attribute	Basic value	Default value	Non-basic value
Shared attributes			
Object type	document layout root, page, block	none	none
Object identifier	as defined in Rec. T.412 (see also Annex A)	none	none
Object class	as defined in Rec. T.412 (see also Annex A)	none	none
Subordinates	as defined in Rec. T.412 (see also Annex A)	none	none
Content portions	as defined in Rec. T.412	none	none
Default value lists	see Table 4/T.501	none	none
Presentation attributes	see Table 5/T.501		
Dimensions	horizontal ≤ 9920 SMU vertical ≤ 14030 SMU	as defined in Rec. T.412	North-American ≤ (10200, 13200) ISO A3 ≤ (14030, 19840) Japanese legal ≤ (12141, 17196) Japanese letter ≤ (8598, 12141)
Position	horizontal = any non-negative integer vertical = any non-negative integer		

6.3.4 *Default value lists for layout component descriptions (see Table 4/T.501)*

TABLE 4/T.501

Defaultable attributes that may be specified in a default value list

Object type	Defaultable attributes that can be specified
Page	dimensions
Block	presentation attributes dimensions position

6.4 *Content architectures*

6.4.1 *Content architecture levels*

Two content architecture levels are defined in this document application profile, namely:

– a formatted character content architecture level;

– a formatted raster graphics content architecture level.

These are defined in the following subsections in accordance with Recommendation T.411.

6.4.2 *Type of coding for the formatted character content architecture level*

The set of graphic elements and the type of coding to be used are defined in Recommendation T.61.

6.4.3 *Type of coding for the formatted raster graphics content architecture level*

The type of coding to be used is as defined in Recommendation T.6. The code extension control function may be used, provided its use is agreed by prior negotiation and is indicated in the document profile. This control function is used to invoke uncompressed mode of coding.

6.4.4 *Presentation attributes*

Table 5/T.501 specifies the allowable presentation attribute values for MM.1.

TABLE 5/T.501

Presentation attributes

Attribute	Basic value	Default value	Non-basic value
Content architecture class	formatted character content formatted raster graphic content	formatted character content	
Character attributes			
Character path	0°, 90°	0°	270°
Line progression	270°	270°	none
Character orientation	0°	0°	90°
Initial offset	horizontal offset = any non-negative integer vertical offset = any non-negative integer	see definition of attribute "initial offset" in Rec. T.416	none
Graphic character sets	basic teletex graphic character set	basic teletex graphic character set	any registered graphic character sets
Character spacing	120 SMU	120 SMU	80, 100, 200 SMU
Line spacing	100, 200, 300, 400 SMU	200 SMU	150 SMU
Alignment	left aligned	left aligned	none
Graphic rendition	default rendition, underlined, not underlined, italicized, not italicized, bold/ not bold	default rendition	proportional spacing, Constant spacing
Raster graphics attributes			
Pel path	0°	0°	none
Line progression	270°	270°	none
Pel spacing	4 and 5 SMU	none	1, 2, 3, 6 SMU
Initial offset	horizontal offset = any integer vertical offset = any integer	see definition of the attribute "initial offset" in Rec. T.417	none

Note – All presentation attributes are defaultable except "pel spacing" which is mandatory.

6.4.5 *Control functions*

Table 6/T.501 defines the allowable values of control function parameters.

TABLE 6/T.501

Control functions applicable to the formatted character content architecture level

Control function with parameters

Control functions	Basic values	Default values	Non-basic values
Identify graphic sub-repertoire (IGS)	0	0	none
Select character spacing (SHS)	0	0	1, 2, 3
Select graphic rendition (SGR)	0, 1, 3, 4, 22, 23, 24	0	26, 50
Select line spacing (SVS)	0, 1, 2, 3	0	4
Code extension	note	none	

Control functions without parameters

* backspace (BS)
* carriage return (CR)
* line feed (LF)
* partial line down (PLD)
* partial line up (PLU)
* space (SP)
* substitute (SUB)

Note – The values are defined by registration numbers and have to be negotiated.

6.4.6 *Attributes of content portions*

Attributes applicable to content portions are defined in Table 7/T.501.

TABLE 7/T.501

Attributes applicable to content portions

Attributes	Qual.	Basic values	Default value	Non-basic values
Content portion identifier	m	as defined in Rec. T.412	none	none
Type of coding	m	ISO 2022, Rec. T.6	none	none
Character coding attributes	---	none	none	none
Raster graphics coding attributes				
Number of pels per line	m	any	none	none
Compression	d	compressed	compressed	uncompressed
Alternative representation	nm	string of graphics characters + CarriageRet. and LineFeed (see Note)	none	none
Content information	m	coded character string, T.6 string	none	none

Note – Graphic characters belong to the basic teletex repertoire.

6.5 *Document profile*

The document profile level used in this document application profile is defined in Table 8/T.501. Every document interchanged in accordance with this document application profile must include a document profile. Every non-basic attribute value used in a document must be indicated in the document profile.

TABLE 8/T.501

Document profile attributes

Attribute	Qual.	Permissible value	Comments
Generic layout structure	nm Note 1	partial	presence of generic layout structure
Specific layout structure	m	present	presence of specific layout structure
Document characteristics	M		
Document application profile	m	mixed mode	
Document architecture class	m	FDA	formatted document architecture
Content architecture classes	m	formatted character and raster graphics content architectures	
Interchange format class	m	A	
Non-basic document character	NM Note 2		
Alternative character sets	nm	basic teletex graphic character set	
Page dimensions	nm	NA ≤ (10200, 13200) ISO A3 ≤ (14030, 19840) Japanese legal ≤ (12141, 17196) Japanese letter ≤ (8598, 12141)	
Raster graphics coding attributes	NM		
Compression	nm	uncompressed	

TABLE 8/T.501 *(cont.)*

Attribute	Qual.	Permissible value	Comments
Character presentation attributes	NM		
Character path	nm	270°	
Character orientation	nm	90°	
Character spacing	nm	80, 100, 200 SMU	
Line spacing	nm	150 SMU	
Graphic rendition	nm	proportional spacing	
Graphic character sets	nm	any registered graphic character sets	
Raster graphics presentation attributes	NM		
Pel spacing	nm	6, 3, 2 and 1 SMU	
Non-basic structure character	NM		
Number of objects per page	nm	> 31 blocks/page	

Note 1 – Present for documents including a partial generic layout structure.

Note 2 – Present for documents including non-basic document characteristics.

6.6 *Interchange format*

The interchange format class used in this document application profile is “A”, as defined in Recommendation T.415.

ANNEX A

(to Recommendation T.501)

Format of the values of the attributes “object identifier”, “object class identifier”, “object class” and “subordinates”

The object identifiers of the specific layout object descriptions are composed of sequences of numbers, each of these numbers representing a particular level of the specific layout structure.

The number assigned to the specific document layout root object description is “1”. The subordinate pages have a second number which uniquely identifies a particular page. The delimiter between “1” and this second number is the “space” character.

Example:

“1 27” corresponding coding: w'31 20 32 37w'H

The subordinate block identifiers are composed of the identifier of the page to which they belong extended with an additional number which uniquely identifies a particular block. The delimiter between the prefix derived from the page identifier and this additional number is the “space” character.

Example:

“1 27 5” corresponding coding: w'31 20 32 37 20 35w'H

The generic structure of a document for mixed mode of operation is composed of a set of object class descriptions, some of them being structured.

The first number of the object class identifier is always “0”. The other number may be allocated as mentioned above for specific object identifiers for object class descriptions which are internally structured.

Example:page class description composed of blocks, etc....

For independent object class descriptions, a second number is added to “0” with a “space” character as a delimiter.

Examples:

a) page class description with two block class descriptions

page class description	“0 5”	coding:	w'30 20 35w'H
first block class description	“0 5 0”	coding:	w'30 20 35 20 30w'H
second block class description	“0 5 1”	coding	w'30 20 35 20 31w'H

b) independent block class description

block class description	“0 25”	coding:	w'30 20 32 35w'H

For both generic and specific structures, content portion identifiers are composed of the identifier of the object/object class to which the content portion belongs and an additional number which uniquely identifies a particular content portion.

Examples:

block description	“1 27 5”	coding:	w'312032372035w'H
content portion	“1 27 5 6”	coding:	w'3120323720352036w'H

associated with the block

The value of the attribute “object class” is the complete identifier of the object class description concerned.

The value of the attribute “generator for subordinates” is a sequence of complete identifiers of subordinate object class descriptions.

The value of the attribute “subordinates” consists of a sequence of numbers, each of which indicates a subordinate object at the next lower level of the hierarchy. Each of these numbers is equal to the last number in the object identifier of the corresponding subordinate object.

The value of the attribute “content portion” consists of a sequence of numbers, each of which indicates a content portion of that object. Each of these numbers is equal to the last number in the content portion identifier.

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