INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

T.541

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

TELEMATIC SERVICES

**TERMINAL EQUIPMENTS AND PROTOCOLS
FOR TELEMATIC SERVICES**

OPERATIONAL APPLICATION PROFILE
FOR VIDEOTEX INTERWORKING

ITU-T Recommendation T.541

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation T.541 was revised by the ITU-T Study Group VIII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

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NOTES

1   As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

CONTENTS

OPERATIONAL APPLICATION PROFILE FOR VIDEOTEX INTERWORKING

(Melbourne, 1988; revised Helsinki, 1993)

1   Scope

This Recommendation defines an operational application profile which conforms to the T.400-Series Recommendations.

Its purpose is to specify an operational structure class suitable for videotex interworking as defined in configuration 1 of Recommendation F.300 and in Recommendation T.564.

2   Field of application

This Recommendation defines an operational application profile, that is in conformance with DTAM (see the T.400-Series Recommendations) and that allows operational structures to be interchanged for the purpose of an 000000international videotex interworking.

This operational application profile defines the features of the operational structure that can be interchanged. These features depend on the document structures as specified in the document application profile (see Recommendation T.504).

3   References

– Rec. F.300 *Videotex service.*

– Rec. X.200 (1988) *Reference model of open systems interconnection for CCITT applications.*

– Rec. X.213 (1992) *Information technology – Network service definition for open systems interconnection.*

– Rec. X.214 (1988) *Transport service definition for open systems interconnection for CCITT applications.*

– Rec. X.224 (1988) *Transport protocol specification for open systems interconnection for CCITT applications.*

– Rec. X.215 (1988) *Session service definition for open systems interconnection for CCITT applications.*

– Rec. X.225 (1988) *Session protocol specification for open systems interconnection for CCITT applications.*

– Rec. X.216 (1988) *Presentation service definition for open systems interconnection for CCITT applications.*

– Rec. X.226 (1988) *Presentation protocol specification for open systems interconnection for CCITT applications.*

– Rec. X.217 (1992) *Service definition for the Association Control Service Element.*

– Rec. X.227 (1992) *Connection-oriented protocol specification for the Association Control Service Element.*

– Rec. T.101 *International interworking for videotex services.*

– Rec. T.400 *Introduction to document architecture, transfer and manipulation.*

– Rec. T.411 *Open document architecture (ODA) and interchange format – Introduction and general principles.*

– Rec. T.412 *Open document architecture (ODA) and interchange format – Document structures.*

– Rec. T.414 *Open document architecture (ODA) and interchange format – Document profile.*

- Rec. T.415 *Open document architecture (ODA) and interchange format – Open document interchange format (ODIF).*

- Rec. T.431 *Document transfer and manipulation (DTAM) – Services and protocols – Introduction and general principles.*

- Rec. T.432 *Document transfer and manipulation (DTAM) – Services and protocols – Service definition.*

- Rec. T.433 *Document transfer and manipulation (DTAM) – Services and protocols – Protocol specification.*

- Rec. T.441 *Document transfer and manipulation (DTAM) – Services and protocols – Operational structure.*

- Rec. T.504 *Document application profile for videotex interworking.*

- Rec. T.523 *Communication application profile DM-1 for videotex interworking.*

- Rec. T.564 *Gateway characteristics for videotex interworking.*

4 Definitions

The definitions of the T.400-Series Recommendations apply also to this Recommendation.

5 Characteristics supported by this operational application profile

5.1 Overview

For the purpose of videotex interworking operational structures are associated with a videotex document to provide an environment for interactive communication, necessary for a recipient to handle the user's input data as intended by the originator.

Therefore the purpose of this clause is to specify the functional description of the features supported by this operational application profile.

5.2 Range of operational structures

For the purpose of an international videotex interworking four operational structures are specified, one of each representing the "data entry structure", the "application control memory", the "administrative structure" and the "special terminal facilities structure" as defined in Recommendation T.564.

5.3 Generic characteristics

Not used.

5.4 Specific characteristics

Each of the operational structures specified in this operational application profile only supports specific features of operational structures.

6 Definition of the operational application profile

6.1 Complexity level of operational structures

For further study.

6.2 Operational profile level

One operational profile has to be defined for every application using operational structures.

This operational profile specifies:

– Four operational structures are used;

– Each of the operational structures only contains specific features.

Details are for further study.

6.3 Specification of operational structures

Four operational structures are specified by this operational application profile.

6.3.1 Data entry structure

The data entry structure as defined in Recommendation T.564 is mapped onto one specific operational structure. No generic operational structure is present.

The DATA-ENTRY-SE is mapped to the specific operational root. The object identifier of the root of this Operational Structure has an assigned value of 11.

The subordinates of DATA-ENTRY-SE are: DATA-ENTRY-PROGRAM-SE, FIELD-SE, RULES-SE, PROMPT-SE, and RESULT-SE.

DATA-ENTRY-PROGRAM-SE is mapped to composite operational object. FIELD-SE, RULES-SE, PROMPT-SE and RESULT-SE are mapped to basic operational objects.

FIELD-SE, PROMPT-SE and RESULT-SE may have associated operational elements.

Subordinate to DATA-ENTRY-PROGRAM-SE is DATA-ENTRY-SUBPROGRAM-SE. DATA-ENTRY-SUBPROGRAM-SE is mapped to basic operational object.

For each of the SEs specified above, constraints are defined on the number of SEs which may exist at one time. These constraints are defined in Recommendation T.564.

6.3.2 Application Control Memory Structure

The Application Control Memory Structure as defined in Recommendation T.564 is mapped onto one specific Operational Structure. No generic Operational Structure is present.

The APPLICATION-CONTROL-MEMORY-SE is mapped to the specific operational root. The object identifier of the root of this Operational Structure has an assigned value of 12.

Subordinate to the APPLICATION-CONTROL-MEMORY-SE is the RECORD-SE. The RECORD-SE is mapped to basic operational object.

For each of the SEs specified above, constraints are defined on the number of SEs which may exist at one time. These constraints are defined in Recommendation T.564.

6.3.3 The Administrative Structure

The Administrative Structure as defined in Recommendation T.564 is mapped onto one specific Operational Structure. No generic Operational Structure is present.

The ADMINISTRATIVE-INFORMATION-SE is mapped to the specific operational root. The object identifier of the root of this Operational Structure has an assigned value of 13.

6.3.4 Special Terminal Facilities Structure

The Special Terminal Facilities Structure as defined in Recommendation T.564 is mapped onto one specific Operational Structure. No generic Operational Structure is present.

The SPECIFIC-TERMINAL-FACILITIES-SE is mapped to the specific operational root. The object identifier of the root of this Operational Structure has an assigned value of 14.

Subordinate to the SPECIAL-TERMINAL-FACILITIES-SE is the REDEFINITION-ENTITY-SE. REDEFINITION-ENTITY-SE is mapped to basic operational object.

For each of the SEs specified above, constraints are defined on the number of SEs which may exist at one time. These constraints are defined in Recommendation T.564.

6.4 Specification of attributes

The attributes applicable to constituents of the operational structure are defined in the following tables, using the following notation:

      –   attribute not applicable;

  M   attribute is mandatory;

  Nm attribute is non-mandatory;

  D   attribute is defaultable;

From the attributes specified for Operational Structures in Annex A, Videotex Interworking will not use the attributes Operational Object Class and Subordinates.

The use of the attribute Document Fragment is for further study.

6.4.1 Attributes of the Data Entry Structure

Table 1 shows the use of attributes defined for objects of Operational Structures.

TABLE 1/T.541

Attributes	DATA-ENTRY-SE	DATA-ENTRY-PROGRAM-SE	DATA-ENTRY-SUBPROGRAM-SE	FIELD-SE	RULES-SE	PROMPT-SE	RESULT-SE
Object type	M	M	M	M	M	M	M
Object identifier (Note)	M	M	M	M	M	M	M
Reference attribute	–	D	D	–	–	–	Nm
Application defined attribute lists	D	D	D	D	D	D	D
Default value lists	Nm	–	–	–	–	–	–

NOTE – This attribute may be omitted when the value can be ambigously derived from the transmission sequence of the relevant objects.

Values for the attribute object-type:

    DATA-ENTRY-SE: 0;

    DATA-ENTRY-PROGRAM-SE: 1;

    DATA-ENTRY-SUBPROGRAM-SE: 2;

    FIELD-SE: 3;

    RULES-SE: 4;

    PROMPT-SE: 5;

    RESULT-SE: 6.

Table 2 shows the use of attributes defined for operational elements.

		Field-content portion		
			Prompt-content portion	
				Result-content portion
Operational element identifier (Note)		M	M	M
Operational element content type		D	D	D
Operational element content		D	D	D
NOTE – This attribute may be omitted when the value can be unambiguously derived from the transmission sequence of the relevant elements.				

6.4.1.1 DATA-ENTRY-SE

6.4.1.2 DATA-ENTRY-PROGRAM-SE

The attribute first-subprogram, defined in Recommendation T.564, is mapped to the reference attribute, defined in Recommendation T.441 (or currently in Annex A).

This application profile specifies the use of this attribute as defaultable. Currently no default value is defined within this standard.

The application defined attribute list for the DATA-ENTRY-PROGRAM-SE contains the following attributes.

Data-Entry-Type	D
Allowed-characters-for-keyword-access	Nm
Character-list-for-keyword-access	Nm
Max-length-keyword-access	D
Allowed-characters-for-a-direct-access-command	Nm
Max-length-direct-access	D

6.4.1.3 RESULT-SE

The attribute Last-subprogram defined in Recommendation T.564 is mapped to the reference attribute defined in Recommendation T.441 (or currently in Annex A). The application defined attribute-list for the RESULT-SE contains the following attribute.

Termination reason	D

6.4.1.4   FIELD-SE

The application defined attribute list for the FIELD-SE contains the following attributes:

Field-layout	D
Field-type	Nm
Protected	Nm
Data-source	Nm
Field-text-marking	Nm

6.4.1.5   DATA-ENTRY-SUBPROGRAM-SE

The attributes:

– reference-to-RULES-SE;

– reference-to-FIELD-SE;

– reference-to-PROMPT-IN-SE, and reference-to-a-PROMPT-OUT-SE,

defined in Recommendation T.564, are mapped to the reference attribute defined in Recommendation T.441 and in Annex A.

This application profile specifies the use of these attributes as defaultable. Currently no default values are defined within this standard.

The application defined attribute list for the DATA-ENTRY-SUBPROGRAM-SE contains the following attributes.

Echo	D
Echoed-character	D
Echo-parameter	Nm

6.4.1.6   Rules-SE

The application defined attribute list for the RULES-SE contains the following attributes:

Time-out	D
List-of-valid-commands	D
Length-of-choice	D
List-of-enabled-choices	D
Allowed-characters	Nm
Character-list	Nm
Entry-invoke-character	Nm
Local-editing	Nm

6.4.1.7   PROMPT-SE

The application defined attribute list for the Prompt-SE contains the following attributes.

Position	D
Dimensions	D

6.4.1.8   Prompt content portion

The application defined attribute of the content portion is the following.

Coding attributes	D

6.4.2   Attributes of the Application Control Memory Structure

Table 3 shows the use of attributes defined for Operational Structures.

TABLE 3/T.541

Attributes	APPLICATION-CONTROL-MEMORY-SE	
		RECORD-SE
Object type	M	M
Object identifier (Note)	M	M
Reference attribute	–	–
Application defined attribute lists	D	D
Default value lists	Nm	–
NOTE – This attribute may be omitted if the value can be unambiguously derived from the transmission sequence of the relevant objects.		

Values for the Attribute Object-type

–   APPLICATION-CONTROL-MEMORY-SE: 7;

–   Record-Content: 8.

6.4.2.1   APPLICATION-CONTROL-MEMORY-SE

6.4.2.2   RECORD-SE

The application defined attribute list for the RECORD-SE contains the following attributes.

Record-content	D
NOTE – Specifying the record-content by using operational elements is for further study.	

6.4.3 Attributes of the administrative structure

Table 4 shows the attributes defined for operational structures.

TABLE 4/T.541

Attributes	ADMINISTRATIVE-INFORMATION-SE			
		LOCAL-HOST-INFORMATION-SE		
			EXTERNAL-HOST-INFORMATION-SE	
				DOCUMENT-INFORMATION-SE
Object type	M	M	M	M
Object identifier (Note)	M	M	M	M
Reference attribute	–	–	–	–
Application defined attribute list		Nm	Nm	D
Default value list	Nm	–	–	–
NOTE – This attribute may be omitted when the value can be ambiguously derived from the transmission sequence of the relevant objects.				

Values for the attribute object-type:

– ADMINISTRATIVE-INFORMATION-SE: 9;

– LOCAL-HOST-INFORMATION-SE: 10;

– EXTERNAL-HOST-INFORMATION-SE: 11;

– DOCUMENT-INFORMATION-SE: 12.

6.4.3.1 ADMINISTRATIVE-INFORMATION-SE

The application defined attribute list for the ADMINISTRATIVE-INFORMATION-SE contains the following attributes:

External-Host-Identifier	M
Local-Host-Identifier	M
Bilateral-Management-Parameter	Nm

6.4.3.2 LOCAL-HOST-INFORMATION-SE

The application defined attribute list for the LOCAL-HOST-INFORMATION-SE contains the following attribute:

Error-Report-to-External-Host	Nm

6.4.3.3 EXTERNAL-HOST-INFORMATION-SE

The application defined attribute list for the EXTERNAL-HOST-INFORMATION-SE contains the following attribute:

Error-Report-to-Local-Host	Nm
Asynchronous-Message	Nm

6.4.3.4 DOCUMENT-INFORMATION-SE

The application defined attribute list for the Document-Information-SE contains the following attributes.

Application-Time-based-charging-period	D
Application-price-Frame-based	D
Application-price-Transaction-based	D
Application-Time-based-charging-price	D
Communication-Cost-Time-based-charging-period	D
Communication-Cost-Time-based-charging-price	D

6.4.4 Attributes of the Special Terminal Facilities Structure

Table shows the use of attributes defined for Operational Structures.

TABLE 5/T.541

Attributes	SPECIAL-TERMINAL-FACILITIES-SE	
		REDEFINITION-ENTITY-SE
Object-type	M	M
Object identifier (Note)	M	M
Reference attribute	–	–
Application defined attribute lists	D	D
Default value lists	Nm	–
NOTE – This attribute may be omitted if the value can be unambiguously derived from the transmission sequence of the relevant objects.		

Values for the Attribute Object-type:

      – SPECIAL-TERMINAL-FACILITIES-SE: 13;

      – REDEFINITION-ENTRY-SE: 14.

6.4.4.1 SPECIAL-TERMINAL-FACILITIES-SE

The application defined attribute-list for the SPECIAL-TERMINAL-FACILITIES-SE contains the following attributes.

Measurement-unit	D
Dimensions	D

6.4.4.2 REDEFINITION-ENTITY-SE

The application defined attribute-list for the REDEFINITION-ENTITY-SE contains the following attributes.

Redefinition-coding	D
Redefinition-content	D
NOTE – Specifying the redefinition content by using operational elements is for further study.	

6.5 Attribute Values for constituents of the Operational Structures

6.5.1 Object Type

The value of the attribute object type is given by the relevant value of the Operational Structure (see Recommendation T.441 and Annex A) and by 6.4.1, 6.4.2, 6.4.4.

6.5.2 Object Identifier

The assignment of values to the operational roots is specified in this Recommendation.

The procedure of assigning values to the subordinate constituents of the Operational Structure is specified in Recommendation T.441 and in Annex A).

6.5.3 Reference Attribute

The reference attribute is used in the context of the DATA-ENTRY-PROGRAM-SE and DATA-ENTRY-SUBPROGRAM-SE and RESULT-SE. The assignment of values to the reference attribute is specified in Recommendation T.564.

6.5.4 Application Defined Attribute Lists

The values of attributes, mapped to the application defined attribute lists, are specified in Recommendation T.564.

This Recommendation specifies the mapping of the attributes defined in Recommendation T.564 to the application defined attribute lists.

6.5.5 Default value lists

For the application defined attributes of each of the SE:

      – DATA-ENTRY-SE;

      – APPLICATION-CONTROL-MEMORY-SE;

–   ADMINISTRATIVE-INFORMATION-SE;

–   SPECIAL-TERMINAL-FACILITIES-SE,

default values for the application defined attributes are specified in this Recommendation.

The default values of each of the concerned SE are mapped to the attribute default value lists of the relevant operational root.

6.5.6   Operational element content type

The attribute type-of-coding, specified in Recommendation T.564, is mapped to the attribute operational element content type, specified in Recommendation T.441 or in Annex A). Recommendation T.564 specifies the values for this attribute.

6.5.7   Operational element content

The attribute content-information, specified in Recommendation T.564, is mapped to the attribute operational element content, specified in Recommendation T.441 or in Annex A). Recommendation T.564 specifies the values for this attribute.

6.6   Default values for application defined attributes

The default value nil indicates that no default value is defined within this standard. In these cases steps 1 and 2 of the defaulting mechanism specified in 9.2.4/T.564 shall uniquely derive the default value for the relevant attribute.

6.6.1   Data entry structure

List of attributes	Default value
DATA-ENTRY-PROGRAM-SE attributes:	
Data-Entry-Type	Nil
Max-Length-Keyword-Access	0
Max-Length-Direct-Access	0
RESULT-SE attributes:	
Termination reason	Nil
FIELD-SE attributes:	
Field-Layout	(0,0), (40,24)
DATA-ENTRY-PROGRAM-SE attributes:	
Echo	"normal"
Echoed character	Nil
RULES-SE attributes:	
Time-Out	600 seconds
Valid-Commands	Nil
Length-Of-Valid-Choices	Nil
List-Of-Enabled-Choices	Nil
PROMPT-SE attributes:	
Position	(0,0)
Dimensions	(40,24)

6.6.2 Application control memory structure

List of attributes	Default value
Record-contents	Nil

6.6.3 Special terminal facilities structure

List of attributes	Default value
SPECIAL-TERMINAL-FACILITIES-SE attributes:	
Measurerment-unit	Characterbox
Dimensions	(40,24)
REDEFINITION-ENTITY-SE attributes:	
Redefinition-coding	Nil
Redefinition-content	Nil

6.7 Implicitly created constituents

Some constituents of the display structure or operational structures are implicitly created at connection establishment time (see Annex A/T.564 or Table 1/T.532).

To ensure that manipulation of these constituents during association is always possible, the following values for the object identifier shall be used:

– "11 0"   for RESULT-SE;

– "11 0 0"   for Result-Content-Portion;

– "13 0"   for LOCAL-HOST-INFORMATION-SE;

– "13 1"   for EXTERNAL-HOST-INFORMATION SE;

– "13 2"   for DOCUMENT-INFORMATION-SE.

Annex A

Operational structure
(This annex forms an integral part of this Recommendation)

It specifies details on operational structures currently not covered by Recommendation T.441. It is intended that future work on operational structures will be compatible with the specifications of this annex.

A.1 Constituents of the operational structure

The operational structure is used (in addition to the specific document) for describing application defined structures in terms of operational objects and operational elements. The following constituents occur in this structure:

– operational root;

– composite operational object;

– basic operational object;

– operational elements.

A.1.1 Operational root

The operational root is the highest level object in the hierarchy of this structure. It is a composite object whose immediate subordinates can be any number and combination of composite and basic operational objects.

A.1.2 Composite operational objects

A composite operational object is a composite object of the operational structure.

A composite operational object can be immediately subordinate to the operational root or to another composite operational object of one hierarchy level above. (Only one level of composite operational objects will be used by videotex interworking.)

The immediate subordinates of a composite operational object can be any number and combination of composite and basic operational objects. Operational elements cannot be directly associated with a composite operational object.

A.1.3 Basic operational objects

A basic operational object is a basic object of the operational structure.

A basic operational object can be immediately subordinate to the operational root or to a composite operational object.

A basic operational object has no subordinates. It is directly associated with the operational elements if any are present.

A.1.4 Operational elements

Operational elements are associated with basic operational objects. They describe application specific data, which are specified in the appropriate Recommendation of the application.

A.2 Definitions of attributes

This subclause defines the attributes and their applicability to the operational objects. Each attribute has a name and a value by which it describes a characteristic of a structure element or the relationship to another structure element.

Table A.1 shows which attribute can be specified for each type of constituent.

TABLE A.1/T.541

Attribute name	Operational root	Composite operational object	Basic operational object	Operational element
Object type Object identifier Operational element identifier	D M* –	D M* –	D M* –	– – M*
Operational object class Subordinates Operational elements Document fragment Reference attribute	Nm Nm – Nm –	Nm Nm – Nm Nm	Nm – Nm Nm Nm	– – – – Nm
Operational element content type Opertional element content	– –	– –	– –	D D
Default value lists	Nm	Nm	–	–
Application defined attribute lists	Nm	Nm	Nm	Nm

M Mandatory
D Defaultable
Nm Non-mandatory
– Not applicable
M* Mandatory; exceptions specified

A.2.1 Identification Attributes

A.2.1.1 Object Type

Mandatory for all operational object class descriptions, defaultable for operational object descriptions.

This attribute must be specified for an operational object description, unless generic structures are used.

The attribute specifies the object type whose value is an integer.

The relevant operational application profile shall specify the values for this attribute and shall identify for each of the relevant objects if it is:

      – an operational root;

      – a composite operational object;

      – a basic operational object.

From this specification it can be derived which attributes are applicable to the relevant object.

See the Summary table of attributes.

A.2.1.2 Object Identifier

Mandatory for all operational object descriptions. For the same exceptions as specified in 5.3.1.3/T.412 the object identifier may be omitted.

This attribute uniquely identifies an operational object description.

The object identifier consists of a sequence of numbers. Each number in the sequence corresponds to a hierarchical level of the specific operational structure and identifies one specific object description at that level (see Recommendation T.412).

The first number in the sequence identifies the object description of the operational root.

An object identifier consisting of just this first number identifies the object description of the operational root.

The operational application profile (see the T.540 Series Recommendations) defines the assignment of integers to the Operational Structures used by the application.

The value of the subsequent numbers in the sequence is not significant. It is required, however, that the sequence of numbers assigned to an object description must distinguish it from all other object descriptions among the Operational Structures used by the relevant application.

The object identifier is represented as a character string of decimal-coded numerals with a space character as separator between each pair of numerals.

The value of this attribute is the sequence of the second parts of the identifiers of the corresponding operationnal element descriptions.

A.2.1.3 Operational element identifier

Mandatory for all operational object descriptions. In the same exceptional cases as specified in 5.3.1.3/T.412, the operational element identifier may be omitted.

This attribute uniquely identifies an operational element description.

The value of the operational element identifier consists of a sequence of numbers which is composed of two parts. In the first part, it is identical to the identifier of the basic operational component that the operational element is associated with. The second part is a number appended to this identifier which identifies this operational element.

The operational element identifier is presented as a character string of decimal-coded numerals with a space character as separator between each pair of numerals.

A.2.2 Relationship attributes

A.2.2.1 Operational object class

Non-mandatory; may be specified for all operational object descriptions.

This attribute is not supported by this annex, as videotex interworking makes no use of generic structures.

A.2.2.2 Subordinates

Non-mandatory for composite operational object descriptions.

This attribute identifies the set of objects immediately subordinate to a composite operational object.

The value of the attribute is a sequence of one or more numbers. Each number corresponds to an immediately subordinate object description and consists of the last number of identifier of that object description. The same number may not occur more that once in the sequence.

The order of the appearance of the numbers in the sequence – and the order of their numeric values – defines the sequential order among the immediately subordinate objects.

A.2.2.3 Operational elements

Non-mandatory for basic component descriptions.

This attribute links operational elements to a particular basic component. There may be zero, one or more operational elements per basic object description.

The value of this attribute is the sequence of the second parts of the identifiers of the corresponding operational element descriptions.

A.2.2.4 Document Fragment

Non-mandatory may be specified for any component description. There is no constraint as to where this attribute may be specified, i.e. at what level or for what component descriptions.

This attribute establishes the relationship between constituents of the Operational Structure and constituents of the logical and layout structures and their associated content portions, thereby defining the document fragments as such.

The value of this attribute is a pair of parameters. The first parameter is the fragment name. The fragment name is to be provided by the application. The second parameter is a sequence of one or more identifiers of the referenced document constituents.

The interpretation of this attribute (e.g. if the reference to an object of the specific document includes the reference to all subordinate objects) is application-dependent.

A.2.2.5 Reference Attribute

Non-mandatory; may be specified for any operational object description, or operational element description. The value of this attribute is a sequence of pairs of parameters. The first parameter is the reference name. The reference name is to be provided by the application. The second parameter is a sequence of identifiers of operational object descriptions, or operational element descriptions.

This attribute permits to reference from one constituent of the Operational Structure to other constituents. This reference can only be interpreted in the specific context of the application.

Maintaining consistency when using this attribute has to be provided by the application and is not within the scope of this annex.

A.2.3 Miscellaneous Attributes

A.2.3.1 Operational Element Content Type

Defaultable; to be specified for any operational element description, if present.

This attribute specifies the type of the content contained in the relevant operational element. The operational application profile shall specify the set of permissible values of this attribute, according to the relevant content architecture.

A.2.3.2   Operational element content

Defaultable; to be specified for any operational element description, if present.

The value of this attribute is a string in accordance with the value of the relevant operational element content type.

A.2.3.3   Default value lists

Non-mandatory; may be specified for composite component description.

This attribute defines default values for attributes of subordinate object descriptions.

The value of the attribute is a sequence of one or more lists of attributes, each list being applicable to a different subordinate object type.

A.2.4   Application defined attribute list

Defaultable for operational object descriptions and operational element descriptions; default value: NULL. NULL means that no default value list is present.

This attribute allows for the definition of application specific information to be included in any operational component or operational element description.

The value of the attribute is a set of application defined values, i.e. the applications define the contents of the lists.

Annex B

Collection of operational application profile in ASN.1
(This annex forms an integral part of this Recommendation)

B.1   Operational data formats

Operational-
     Descriptor   ::=   CHOICE {

operational-object-class   [0]   IMPLICIT Operational-Class-Descriptor,
                           -- not used by the videotex interworking application;
                           -- therefore not specified in this document

operational-object   [1]   IMPLICIT Operational-Object-Descriptor,
operational-element   [2]   IMPLICIT Operational-Element }

Operational-
     Information-Identifier   ::=   Object-Or-Class-Identifier
                           -- used in the case of the delete operation

B.1.1   Operational object descriptor

Operational-Object-
     Descriptor   ::=   SEQUENCE {

object-type   Operational-Object-Type OPTIONAL,
descriptor-body   Operational-Object-Descriptor-Body OPTIONAL }

Operational-Object-
     Type   ::=   INTEGER {
                           data-entry (0),
                           data-entry-program (1),
                           data-entry-subprogram (2),
                           field (3),
                           rules (4),
                           prompt (5),
                           result (6),
                           application-control-memory (7),
                           record (8),
                           document-information (12),
                           special-terminal-facilities (13),
                           redefinition-entity (14) }

Operational-Object-

Descriptor-Body	**::=**	**SET {**	
object-identifier			**Object-Or-Class-Identifier OPTIONAL,**
subordinates		**[0]**	**IMPLICIT SEQUENCE OF Numeric-String OPTIONAL,**

> *-- not used by the videotex interworking application;*
> *-- therefore not specified in this document*

operational-elements		**[1]**	**IMPLICIT SEQUENCE OF Numeric-String OPTIONAL,**
object-class		**[2]**	**IMPLICIT Object-Or-Class-Identifier OPTIONAL,**

> *-- not used by the videotex interworking application;*
> *-- therefore not specified in this document*

-- document-fragment		**[3]**	**IMPLICIT Document-Fragment OPTIONAL,**

> *-- not used by the videotex interworking application;*
> *-- therefore not specified in this document*

reference-attribute		**[4]**	**IMPLICIT Reference-Attribute OPTIONAL,**
default-value-lists		**[5]**	**IMPLICIT Default-Value-Lists OPTIONAL,**
application-defined-attribute-lists		**[6]**	**IMPLICIT Application-Defined-Attribute-Lists OPTIONAL }**

B.1.2 Operational elements

Operational-Element	**::=**	**SET {**	
operational-element-identifier			**Object-Or-Class-Identifier OPTIONAL,**
reference-attribute		**[4]**	**IMPLICIT Reference-Attribute OPTIONAL,**

> *-- not used by the videotex interworking application*

application-defined-attribute-lists		**[6]**	**IMPLICIT Application-Defined-Attribute-Lists OPTIONAL,**
operational-element-content-type		**[7]**	**Operational-Content-Type OPTIONAL,**
operational-element-content		**[8]**	**IMPLICIT OCTET STRING OPTIONAL }**

B.1.3 Common attributes

Reference-Attribute	**::=**	**SEQUENCE OF SEQUENCE {**	
reference-name		**[0]**	**IMPLICIT OCTET STRING OPTIONAL,**

> *-- '00' H reference to a rule SE*
> *-- '01' H reference to a prompt-in SE*
> *-- '02' H reference to a prompt-out SE*
> *-- '03' H reference to a field SE*
> *-- in the case of first subprogram and last subprogram no*
> *-- reference name is used*

referenced-constituent			**Object-Or-Class Identifier }**
Default-Value-Lists	**::=**	**Operational-Object-Descriptor-Body**	

B.1.4 Application defined attributes

Application-Defined-Attribute-Lists	**::=**	**SET {**	

> *-- DATA ENTRY STRUCTURE*

data-entry-type		**[0]**	**IMPLICIT INTEGER {**
			information-retrieval (1),
			data-collection (2),
			on-the-fly (3),
			duplex (4) } OPTIONAL,
allowed-characters-for-a-keyword-access-command		**[1]**	**IMPLICIT BOOLEAN OPTIONAL,**

> *-- true = yes*
> *-- false = no*

character-list-for-keyword-access		**[2]**	**Character-List OPTIONAL,**
max-length-keyword-access		**[3]**	**IMPLICIT INTEGER OPTIONAL,**

allowed-character-for-a-direct-access-command	**[4]**	**IMPLICIT BOOLEAN OPTIONAL,**
		-- true = yes
		-- false = no
termination-reason	**[5]**	**IMPLICIT Termination-Reason OPTIONAL,**
field-layout	**[6]**	**IMPLICIT Field-Layout OPTIONAL,**
field-text-marking		**CHOICE {**
	[7]	**IMPLICIT NULL,**
	[8]	**Appearance } OPTIONAL,**
echo	**[9]**	**IMPLICIT INTEGER {**

normal-echo (0),
fixed-echo (1),
null (2) } OPTIONAL,

echoed-character	**[10]**	**G0G2-Character OPTIONAL,**
echo-parameter	**[11]**	**Appearance OPTIONAL,**
time-out	**[12]**	**IMPLICIT INTEGER OPTIONAL,**
		-- measured in seconds
entry-invoke-character	**[13]**	**G0G2-Character OPTIONAL,**
local-editing	**[33]**	**IMPLICIT INTEGER OPTIONAL,**
		-- details for further study
length-of-valid-choices	**[15]**	**IMPLICIT INTEGER {**

one-digit (1)
two-digits (2) } OPTIONAL,

list-of-enabled-choices	**[16]**	**List-of-Choices OPTIONAL,**
allowed-characters-for-data-collection	**[17]**	**IMPLICIT INTEGER {**

forbidden (0),
allowed (1),
alphabetic (2),
alphanumeric (3),
numeric (4) } OPTIONAL,

character-list	**[18]**	**Character-List OPTIONAL,**
list-of-valid-commands	**[19]**	**OCTET STRING OPTIONAL,**

-- the OCTET STRING is encoded in a way that the bits are
-- representing the commands as follows:
-- bit 0: time out, bit 2: V2, bit 3: V3, bit 8: D1a,
-- bit 9: D1b, bit 10: D1c, bit 11: D1d, bit 14: D4, bit 15: D5,
-- bit 16: D6, bit 17: D7, bit 19: D9, bit 20: D10, bit 21: D11,
-- bit 22: D12, bit 23: D13, bit 24: D14, bit 27: D17, bit 28:
-- D18, bit 29: end-of-field,
-- a command is enabled by setting the bit to 1 and disabled by
-- setting the bit to 0.

field-type	**[20]**	**IMPLICIT INTEGER {**

data-collection-field (0),
country-code-field (1),
tel-number-field (2),
subscr-number-field (3),
co-user-suffix-field (4),
user-number-field (5),
subscr-title-field (6),
subscr-name-field (7),
additional-name-field (8),
street-field (9),
town-field (10),
postcode-field (11),
date-field (12),
time-field (13),
date-and-time-field (14)
} OPTIONAL,

system-field-attributes		**[21]**	**IMPLICIT System-Field-Attributes OPTIONAL,**

-- the following two attributes are used for prompts, the
-- second also for the SPECIAL-TERMINAL-FACILITIES-SE

position		**[22]**	**IMPLICIT Measure-Pair OPTIONAL,**
dimension		**[23]**	**IMPLICIT Measure-Pair OPTIONAL,**

-- APPLICATION CONTROL MEMORY STRUCTURE

record-content		**[14]**	**IMPLICIT Record-Content OPTIONAL,**

-- SPECIAL TERMINAL FACILITIES STRUCTURE

measurement-unit		**[31]**	**IMPLICIT Measurement-Unit OPTIONAL,**
redefinition-coding		**[25]**	**IMPLICIT Redefinition-Coding OPTIONAL,**
redefinition-content		**[26]**	**IMPLICIT IMPLICIT OCTET STRING OPTIONAL,**

-- ADMINISTRATIVE STRUCTURE

a-price-frame-based		**[27]**	**IMPLICIT Real-Number OPTIONAL,**
a-price-transaction-based		**[32]**	**IMPLICIT Real-Number OPTIONAL,**
a-time-based-charging-price		**[28]**	**IMPLICIT Real-Number OPTIONAL,**
a-time-based-charging-period		**[29]**	**IMPLICIT INTEGER OPTIONAL,**
c-cost-tbc-period		**[30]**	**IMPLICIT INTEGER OPTIONAL,**
c-cost-tbc-price		**[24]**	**IMPLICIT Real-Number OPTIONAL,**

-- OPERATIONAL ELEMENTS

coding attributes		**[8]**	**IMPLICIT Videotex-Coding-Attributes**

-- coding attributes are to be specified for prompt content
-- portions by the relevant content architecture; coding
-- attributes are the same as for blocks
}

B.1.5   Basic types

Object-Or-Class-			
Identifier	**::=**		**[APPLICATION 1] IMPLICIT Printable-String**

-- only digits and space are used in the present version of
-- the standard
-- a "null" value is represented by an empty string
-- the first digit ienditifies the relevant root:
-- data entry root "0", application
-- control memory root "1", administrative
-- information root "2", special terminal
-- facilities root "3"

Character-List	**::=**		**CHOICE {**
bit-8-character-list		**[0]**	**IMPLICIT SET OF G0G2-Bit-8-Character,**
bit-7-character-list		**[1]**	**IMPLICIT SET OF G0G2-Bit-7-Character }**
G0G2-Character	**::=**		**CHOICE {**
bit-8-character		**[0]**	**IMPLICIT G0G2-Bit-8-Character,**
bit-7-character		**[1]**	**G0G2-Bit-7-Character }**
G0G2-Bit-8-			
Character	**::=**		**INTEGER**

-- G0 or G2 character included. Space with 8-bit encoding;
-- values between 20H-7FH and AOH-FFH

G0G2-Bit-7-			
Character	**::=**		**CHOICE {**
g0-character		**[0]**	**IMPLICIT INTEGER {**

-- G0 character included. Space with 7-bit encoding;
-- values between 20H-7FH

g2-character		**[1]**	**IMPLICIT INTEGER {**

-- G2 character included. Space with 7-bits encoding;
-- values between 20H-7FH

| Field-Layout | ::= | SEQUENCE OF SEQUENCE { |
| | | Measure-Pair, Measure-Pair } |

| List-of-Choices | ::= | BIT STRING |

-- *the length of the string is equal to 10 bits if the length*
-- *of choices is 1, equal to 100 bits if the length is 2*
-- *the bit position is representing actual choice value*

| Appearance | ::= | IMPLICIT SET { |

foreground-colour	[0]	IMPLICIT INTEGER OPTIONAL,
background-colour	[1]	IMPLICIT INTEGER OPTIONAL,
underline	[2]	IMPLICIT BOOLEAN OPTIONAL,

-- *true means on; false means off*

| reverse-video | [3] | IMPLICIT BOOLEAN OPTIONAL, |

-- *true means on; false means off*

| flashing | [4] | IMPLICIT BOOLEAN OPTIONAL, |

-- *true means on; false means off*

-- *the following parameters are only used for the echo parameter*

| height | [5] | IMPLICIT BOOLEAN OPTIONAL, |

-- *true means double; false means normal*

| width | [6] | IMPLICIT BOOLEAN OPTIONAL, |

-- *true means double; false means normal*
}

Termination-Reason	::=	INTEGER {
		time-out (0), V2 (2),
		V3 (3), D1a (8),
		D1b (9), D1c (10), D1d (11),
		D4 (14), D5 (15), D6 (16),
		D7 (17), D9 (19), D10 (20),
		D11 (21), D12 (22), D13 (23),
		D14 (24), D17 (27), D18 (28),
		end-of-field (29) }

| Real-Number | ::= | SEQUENCE { |

| integer-part | [0] | IMPLICIT INTEGER DEFAULT 0, |
| decimal-exponent | [7] | IMPLICIT INTEGER DEFAULT 2 } |

-- *the encoded real number is obtained by dividing the*
-- *interger-part by 10** decimal-exponent*

| Measurement-Unit | ::= | INTEGER { |

| | | character-box (0) } |

| Measure-Pair | ::= | SEQUENCE { |

| horizontal | | INTEGER, |
| vertical | | INTEGER } |

| Redefinition-Coding | ::= | SEQUENCE { |

redefinition-type	[0]	IMPLICIT INTEGER {
		drcs (0),
		colour-redefinition (1),
		reset-sequence (2),

| redefinition-coding-data-
syntax | [1] | IMPLICIT OBJECT IDENTIFIER } |

Record-Content	::=	SET OF CHOICE {
		D-CREATE,
		D-DELETE,
		D-MODIFY }

-- *the operations are definied in Recommendations T.432*
-- *and T.433*

```
Operational-Content-
            Type            ::=         CHOICE {
                                        [0]     IMPLICIT INTEGER {
                                            g0g2-bit-8 (0),
                                                -- G0/G2 character included. Space with 8-bit encoding
                                            g0g2-bit-7 (1),
                                                -- G0/G2 character included. Space and SS2 with
                                                -- 7-bit encoding
                                            ascii 1) (3)
                                                -- T.50 (international reference version)
                                                -- character
                                                    } OPTIONAL,
                                                -- the integer value is used in the cases of a field
                                                -- content portion and a result content portion
                                        [1]     IMPLICIT OBJECT IDENTIFIER OPTIONAL }
                                            -- the OBJECT IDENTIFIER is used in the case in the case of a
                                            -- prompt content portion

System-Field-Attributes        ::=     SEQUENCE {

protected                              [0]     IMPLICIT BOOLEAN OPTIONAL,
                                            -- true = protected
                                            -- false = not protected
data-source                            [1]     IMPLICIT BOOLEAN OPTIONAL,
                                            -- true = data supplied by local host
                                            -- false = data supplied by local user    }
```

Annex C

Summary of ASN.1 object identifiers
(This annex forms an integral part of this Recommendation)

ASN.1 object identifier value	Description	Reference
0 1 8 16 2	Object identifier for this operational application profile	This annex C

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1) American standard code for information interchange.