INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 11185-16

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Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions —

Part 16:
FVT2114 — Terminal Signal Titles Control Object

Technologies de l'information — Profils normalisés internationaux FVT2nn — Classe de base de terminal virtuel — Registre de définitions de type d'objet de commande —

Partie 16: FVT2114 — Objet de commande de titres de signal de terminal

Reference number
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC1. In addition to developing International Standards, ISO/IEC JTC1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75% of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 11185-16 was prepared with the collaboration of

— OSI Asia-Oceania Workshop (AOW);
— European Workshop for Open Systems (EWOS);
— Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 11185 consists of the following parts, under the general title *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions*:

—*Part 1: FVT211, FVT212 — Sequenced and Unsequenced Application Control Objects*
—*Part 2: FVT213, FVT214 — Sequenced and Unsequenced Terminal Control Objects*
—*Part 3: FVT215, FVT216 — Application RIO Record Loading Control Object, Terminal RIO Record Notification Control Object*
—*Part 4: FVT217 — Horizontal Tabulation Control Object*
—*Part 5: FVT218 — Logical Image Control Object*
—*Part 6: FVT219 — Status Message Control Object*
—*Part 7: FVT2110 — Entry-Control Control Object*
—*Part 8: FVT221 — Forms FEICO (Field Entry Instruction Control Object) No.1*
—*Part 9: FVT222 — Paged FEICO (Field Entry Instruction Control Object) No.1*
—*Part 10: FVT231 — Forms FEPCO (Field Entry Pilot Control Object) No.1*
—*Part 11: FVT232 — Paged FEPCO (Field Entry Pilot Control Object) No.1*
—*Part 12: FVT2116, FVT2117, FVT2118, FVT2119 — Generalized Telnet Synch, Signal, Negotiation and Subnegotiation Control Objects*
—*Part 13: FVT2111 — Waiting Time Control Object*
—*Part 14: FVT2112 — Printer Control Object*
—*Part 15: FVT2113 — Field Definition Management Control Object*
—*Part 16: FVT2114 — Terminal Signal Titles Control Object*
—*Part 17: FVT2115 — Help Text Control Object*

Annex A forms an integral part of this part of ISO/IEC ISP 11185. Annex B is for information only.

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Introduction

This International Standardized Profile ISO/IEC ISP 11185 is defined within the context of Functional Standardization, in accordance with the principles specified in ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles". The context of Functional Standardization is one part of the overall field of Information Technology (IT) standardization activities, covering base standards, profiles and registration mechanisms.

The Open Systems Interconnection (OSI) Standard ISO 9040 for the Virtual Terminal Basic Class Service identifies a requirement for an International Register of VT Control Object type definitions. Procedures for the operation of this International Register are laid down in ISO/IEC 9834-5. This International Standardized Profile provides this register. The individual entries in this register constitute Interchange Format and Representation Profiles (F-Profiles) within the framework of ISO/IEC TR 10000.

This part of ISO/IEC ISP 11185 was developed in close cooperation between the three Regional OSI Workshops, namely the OSE Implementors' Workshop (OIW) of the United States, the European Workshop for Open Systems (EWOS) and the OSI Asia-Oceania Workshop (AOW). It was developed under the editorship of EWOS.

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Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions —

Part 16:

FVT2114 — Terminal Signal Titles Control Object

1 Scope

1.1 General

The concept of Profiles for OSI, and the structure of the International Standardized Profiles that document them, are defined in ISO/IEC TR 10000-1. Such Profiles are divided into a number of different classes and sub-classes. Two of these classes contain sub-classes comprising functions of the Virtual Terminal Basic Class Service and Protocol specified in the base standards ISO 9040 and ISO 9041. These are the Application Profiles (A-Profiles) and the Interchange Format and Representation Profiles (F-Profiles).

The relationship between A-Profiles and F-Profiles is described in 7.3.2 of ISO/IEC TR 10000-1 and is as follows. Application Layer base standards require, implicitly or explicitly, the structure of information carried or referenced by them to be specified for each instance of communication. It is the purpose of F-Profiles to specify such information structures. Particular functional requirements may then be met by the combination of an A-Profile with one or more F-Profiles.

Establishment of a VT-association involves the selection by negotiation of a particular Virtual Terminal Environment profile (VTE-profile), and of particular values for any arguments of that VTE-profile. The VTE-profile specification, and possibly also the values of certain VTE-profile arguments, may in turn reference the definitions of VT control object types and assignment types. These VTE-profiles, control object types and assignment types are thus information structures that require explicit reference within the VT protocol. Particular instances of these structures are fully defined within the base standards, but the base standards also provide for further instances to be defined by registration. Each registered instance constitutes an F-Profile within the framework of ISO/IEC TR 10000.

The Virtual Terminal Basic Class Service and Protocol may be used to realise a wide range of distinct functions. Particular functions may be realised through the selection of appropriate VT functional units, F-Profiles and other VTE-profile argument values. The specification of the selection required to realise a particular function and to promote interoperability constitutes a Virtual Terminal A-Profile within the framework of ISO/IEC TR 10000.

The three International Registers of VT information structures and the specifications of VT Application Profiles are each published as a separate multi-part ISP as follows:

— ISO/IEC ISP 11184 is the Register of VTE-profiles;

— ISO/IEC ISP 11185 is the Register of control object type definitions;

— ISO/IEC ISP 11186 is the Register of assignment-type definitions;

— ISO/IEC ISP 11187 contains the specifications of VT Application Profiles.

This part of ISO/IEC ISP 11185 contains the definition of a control object type that may be used by an Application VT-User to associate titles, intended to be meaningful to a human user at an end-terminal system, with any of the terminal signals supported by the Sequenced and Unsequenced Terminal CO types (taxonomy identifiers FVT213 and FVT214) defined in part 2 of ISO/IEC ISP 11185.

1.2 Position within the taxonomy

The taxonomy of International Standardized Profiles for OSI is laid down in ISO/IEC TR 10000-2. Within the classification scheme of this taxonomy, the OSI Profiles specified in this International Standardized Profile are in the Virtual Terminal Registered Object sub-class of the class of Interchange Format and Representation Profiles.

A Profile within this subclass has a Profile identifier of the form FVT*abc*, where *abc* is a structured numerical identifier that identifies the position of the Profile within each of the three levels of subdivision of the subclass. The values of *a* and *b* are single digits but *c* is an integer that is not necessarily a single digit.

In principle the ISO Virtual Terminal model allows for multiple classes of operation, although at the time of publication of this International Standardized Profile only the Basic Class has been defined. The value of the identifier component *a* distinguishes between distinct types of information object as follows:

— *a* = 1 for Basic Class VTE-profiles;

— *a* = 2 for Basic Class Control Objects;

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— a = 3 for Basic Class Assignment Types.

Values of a greater than 3 are reserved for future developments.

This International Standardized Profile ISO/IEC ISP 11185 contains the specifications of the Profiles with identifiers of the form FVT2*bc*. For this form of identifier, the component b distinguishes between the five major classifications of Basic Class Control Objects as follows:

— b = 1 for Miscellaneous Control Objects;

— b = 2 for Field Entry Instruction Control Objects;

— b = 3 for Field Entry Pilot Control Objects;

— b = 4 for Reference Information Objects;

— b = 5 for Termination Conditions Control Objects.

Each of these classifications corresponds to a sub-register under the procedures of ISO/IEC 9834-5. The identifier component c is the serial number of the control object type in the appropriate sub-register. Values of b greater than 5 are reserved for new classifications of Basic Class Control Objects that may be defined in future amendments to ISO 9040.

This part of ISO/IEC ISP 11185 contains the definition of the Miscellaneous Control Object type with the Profile identifier

FVT2114 — Terminal Signal Titles Control Object.

1.3 Scenario

The specification of the Virtual Terminal Service is given in ISO 9040. It is based on a model in which two VT-users communicate by means of a shared Conceptual Communication Area (CCA) that is a conceptual part of the VT service-provider. Information exchange is modelled by one VT-user updating the content of the CCA and the changed state of the CCA then being made accessible to the peer VT-user.

Control objects (COs) form one of the types of information object that may be present in the CCA. This is illustrated in figure 1, in which CO-1, CO-2, ... CO-*n* represent a number of different control objects present in the CCA. The negotiation during establishment of a VT-association will determine whether or not these will include control objects of either or both of the types whose definitions are given in this part of ISO/IEC ISP 11185.

The CCA is structured by the Virtual Terminal Service into a number of components. For a control object the Data Structure Definition (DSD) component of the CCA contains the syntax of its information content, including the range of possible values and the permitted update operations. The current value of its information content is contained in the Control, Signal and Status store (CSS) component. Updates to the current value take place through the issue of VT service primitives by one VT-user to the service-provider. Changes of state of the CCA are made accessible through the issue of VT service primitives by the service-provider to the peer VT-user.

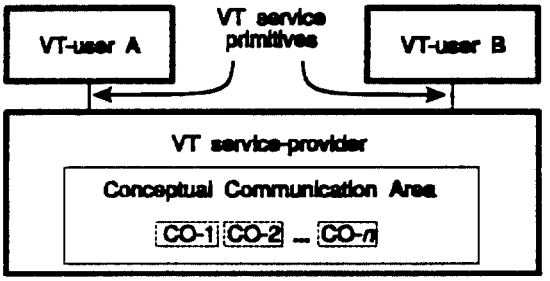

Figure 1— Control objects in the VT Service model

By clause 14 of ISO 9040, COs enable VT-users to handle control information related to virtual terminal functions and to real devices. This control is exercised by the VT-users through semantics associated with the information content and with the update operations of the CO. Definition of the semantics, or specification of the source of the semantics if the semantic details are not fully prescribed, forms part of the registered definition of the CO. These semantics are not however of concern to the VT service-provider itself. The DSD will contain an ASN.1 object identifier that identifies the registered definition, but the VT service-provider merely acts as a repository of this value. It is only the VT-user that requires knowledge of the registered definition.

NOTE 1 — The VTE-parameter values that determine the syntax of the information content may not be negotiated explicitly during association establishment. Moreover, in the case of non-parametric COs these values do not determine the details of the syntax. Such values and details form part of the registered definition of the CO. Since the VT service-provider is not required to have knowledge of this registered definition, in principle the VT-users provide the VT service-provider with such information through local management procedures. Whether or not this is necessary in practice depends on the configuration of the implementations concerned.

The control object type defined in this part of ISO/IEC ISP 11185 assumes an asymmetry between the two communicating end systems. One end system is assumed to have a terminal role and to contain devices for the input and display of data and for signalling. These devices form part of the VT-user component of that end system. The other end system is assumed to have an application role and to contain an application package that the terminal end system desires to access. This asymmetry may, but need not, be recognised by the VT Service; provision for such recognition exists only in an S-mode VT-association.

The Virtual Terminal Protocol specification given in ISO 9041-1 models the VT service-provider in terms of protocol exchange between two Virtual Terminal

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Protocol Machines (VTPMs), each with its own CCA. The CCA of each VTPM is updated both by service primitives received from its own VT-user and by protocol elements received from the peer VTPM. Corresponding service primitives and protocol elements are issued by the VTPM to provide notification of changes to the content of its CCA. This is illustrated in figure 2 in the context of the asymmetric end systems described above. The control object type definition given in this part of ISO/IEC ISP 11185 is expressed in terms of this model.

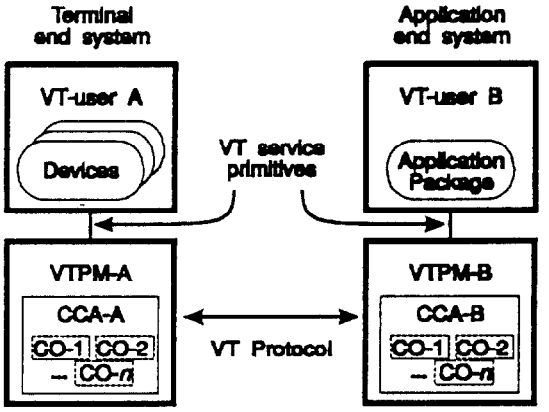

Figure 2— Control objects in the VT Protocol model

For certain types of control object the abstract syntax of ISO 9041-1 does not provide a complete specification for the representation of CO update operations. This arises where the abstract syntax of ISO 9041-1 makes use of an ASN.1 any type, or where symbolic values have to be encoded in terms of an ASN.1 integer type. Control object type definitions are required by ISO/IEC 9834-5 to provide the necessary refinement of the abstract syntax.

NOTE 2 — Since an abstract syntax is made available for use through its inclusion in a presentation context, and since the Presentation service-provider has no knowledge of control object type definitions, in principle the VT-users provide the Presentation service-provider with these refinements to the abstract syntax through local management procedures. Whether or not this is necessary in practice depends on the configuration of the implementations concerned.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 11185. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this International Standardized Profile are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs, and ITU-T maintains published editions of its current Recommendations.

ISO/IEC 8822:1994, *Information technology — Open Systems Interconnection — Presentation service definition.* (See also ITU-T Recommendation X.216.)

ISO/IEC 8824:1990, *Information technology — Open Systems Interconnection — Specification of Abstract Syntax Notation One (ASN.1).* (See also ITU-T Recommendation X.208.)

ISO/IEC 9040:1990, *Information technology — Open Systems Interconnection — Virtual Terminal Basic Class Service.*

ISO/IEC 9041-1:1990, *Information technology — Open Systems Interconnection — Virtual Terminal Basic Class Protocol —Part 1: Specification.*

ISO/IEC 9041-2:1993 , *Information technology — Open Systems Interconnection — Virtual Terminal Basic Class Protocol —Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO/IEC 9646-7:[1], *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation conformance statements.* (See also ITU-T Recommendation X.296).

ISO/IEC 9834-1:1993, *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities — Part 1: General Procedures.* (See also ITU-T Recommendation X.660.)

ISO/IEC 9834-5:1991, *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities — Part 5: Register of VT Control Object Definitions.*

ISO/IEC TR 10000-1:1992, *Information technology — Framework and taxonomy of International Standardized Profiles — Part 1: Framework* (second edition).

ISO/IEC TR 10000-2:1994, *Information technology — Framework and taxonomy of International Standardized Profiles — Part 2: Principles and taxonomy for OSI Profiles* (third edition).

ISO/IEC 10731:1994, *Information technology — Open Systems Interconnection — Basic Reference Model — Conventions for the definition of OSI references.* (See also ITU-T Recommendation X.210.)

3 Definitions

For the purposes of this part of ISO/IEC ISP 11185 the following definitions apply.

[1] To be published.

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3.1 General OSI terminology

3.1.1 This part of ISO/IEC ISP 11185 makes use of the following terms defined in ISO/IEC 10731:

a) service primitive;

b) service-provider.

3.1.2 This part of ISO/IEC ISP 11185 makes use of the following terms defined in ISO/IEC 8822:

a) abstract syntax;

b) presentation context.

3.1.3 This part of ISO/IEC ISP 11185 makes use of the following terms defined in ISO/IEC 8824:

a) any type;

b) object descriptor type;

c) object identifier.

3.1.4 This part of ISO/IEC ISP 11185 makes use of the following terms defined in ISO/IEC 9834-1:

a) registration;

b) registration-structured-name.

3.2 Terminology of VT base standards

3.2.1 This part of ISO/IEC ISP 11185 makes use of the following terms defined in ISO/IEC 9040:

a) A-mode;

b) control object;

c) device object;

d) net-effecting;

e) object updating device;

f) S-mode;

g) VT-association;

h) VT-environment (VTE);

i) VT-user;

j) VTE-parameter;

k) VTE-profile;

l) VTE-profile argument.

3.2.2 This part of ISO/IEC ISP 11185 makes use of the following term defined in ISO/IEC 9041-1:

a) protocol element.

4 Abbreviations

For the purposes of this part of ISO/IEC ISP 11185 the following abbreviations apply.

AOW	OSI Asia-Oceania Workshop;
EWOS	European Workshop for Open Systems;
OIW	OSE Implementors' Workshop.
OSE	Open Systems Environment

All other abbreviations used are defined in ISO/IEC TR 10000-1 or ISO 9040.

5 Principles of conformance to VT Profiles

An implementation of the Virtual Terminal Protocol conforms to an FVT2*nn* Profile that defines a control object type if the protocol implementation is capable of sending and receiving PDUs corresponding to all update operations permitted for that CO type.

Conformance of a protocol implementation to an FVT2*nn* Profile does not place requirements on the ability of the implementation to negotiate the presence in the CCA of an instance of this CO type. Such requirements fall within the scope of conformance to an FVT1*nn* Profile that specifies a VTE-profile.

A system that includes an implementation of the VT Protocol may be claimed to conform also to an AVT*nn* Profile. Conformance to an AVT*nn* Profile may require that CO update operations received by the VT-user component of the system are interpreted in accordance with the semantics defined within the appropriate CO type definition. Conformance to CO semantics is not within the scope of conformance to any FVT*nnn* Profile.

The conformance requirements of the Virtual Terminal Protocol are specified in clause 13 of ISO 9041-1. The supplier of a protocol implementation which is claimed to conform to ISO 9041-1 is required to complete a copy of the Protocol ICS (PICS) proforma provided in ISO/IEC 9041-2, to form a PICS for the implementation.

Annex A of this part of ISO/IEC ISP 11185 provides a Profile Requirements List (Profile RL) for the Profile FVT2114 specified herein, in accordance with ISO/IEC 9646-7.

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By 6.4 of ISO/IEC 9646-7 both the PICS and this RL form part of the Profile ICS for any Implementation of the VT Protocol that claims conformance to the Profile FVT2114 specified herein. If the PICS is an IUT PICS then the RL specifies constraints on the answers that may be given in it for a test of conformance to this part of ISO/IEC ISP 11185. The RL may also be used in conjunction with a Product PICS that covers more than one Profile. In this case it may serve as the annotation required, in accordance with 6.2 of ISO/IEC 9646-7, to form an IUT PICS from the Product ICS for testing of conformance to this part of ISO/IEC ISP 11185.

6 Entry number

The remaining clauses of this part of ISO/IEC ISP 11185 provide the entry for a Terminal Signal Titles Control Object in the International Register of VT Control Object Type Definitions. The entry is structured in accordance with the requirements of ISO/IEC 9834-5. These requirements specify that this International Register shall consist of a number of sub-registers, each corresponding to a major classification of VT Control Object.

This entry is the fourteenth in the sub-register for Miscellaneous Control Objects. This register assigns it the entry number:

MISCO-14.

7 Name of sponsoring authority

This entry is sponsored by the European Workshop for Open Systems (EWOS).

8 Date

The date of submission of this proposal was 1993-09-08.

9 Identifier

The name assigned to an information object by an International Register is required by ISO/IEC 9834-1 to be a registration-hierarchical-name. A registration-hierarchical-name may have more than one form. The permitted forms include an ASN.1 object identifier as defined in ISO/IEC 8824 and a distinguished name as defined in ISO/IEC 9594-2.

In accordance with A.4 of ISO/IEC 9834-5, this register assigns the following object identifier form for the name of this register entry:

{ iso(1) standard(0) 9834 vt-co-def(5) misco(0) 14 }

In accordance with 20.1.1 of ISO 9040, this object identifier shall be used as the value of the CO-type-identifier VTE-parameter for a control object in order to identify this register entry as the source of the information structure and semantic content of the control object.

This register does not assign any other form to the name of this entry.

NOTE — By ISO/IEC 9834-1 a distinguished name for the purposes of the OSI Directory may only be assigned together with an object identifier when the object identifier form is generated under the arc { joint-iso-ccitt(2) country(16) country-name }.

10 Descriptor value

The value of the ASN.1 object descriptor type assigned to this register entry is:

"CO for conveying Terminal Signal Titles".

11 CO parameters

This CO type presumes an asymmetry of use between the two end systems in which one has a terminal role and the other an application role. Such an asymmetry is assigned in accordance with note 1 to clause 12 of ISO 9040. It is not necessary for this asymmetry to be recognised by the VT service-provider in accordance with 19.3.2 of ISO 9040, which provides for the assignment, in S-mode only, of Terminal VT-user and Application VT-user roles.

This register entry specifies the following values for VTE-parameters of this control object type:

CO-name:	any value unique within the VTE
CO-structure:	"non-parametric"
CO-access:	as for the FDCO
CO-priority:	"normal"
CO-trigger:	"not selected".

The CO-structure VTE-parameter is present only if the Structured Control Objects VT functional unit is selected.

The value of the CO-access VTE-parameter should be set to permit access only by the VT-user with the application role. This value will depend on whether the VT-association was initiated by the terminal or application end system.

NOTE — A single VTE-profile argument may be used to set the value of the CO-access VTE-parameter for all control objects in the CCA that presume an asymmetric assignment of terminal and application roles to the two communicating end systems.

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12 CO values, syntax and semantics

The Terminal Signal Titles Control Object allows an Application VT-User to associate titles, intended to be meaningful to a human user at the terminal end-system, with any of the terminal signals supported by the Sequenced and Unsequenced Terminal Control Object types (with taxonomy identifiers FVT213 and FVT214) defined in part 2 of ISO/IEC ISP 11185.

The functionality described in this control object definition is seen as an alternative to the use of the Status Message Control Object to display the semantics of terminal signals to the human user. The intention is that supporting Terminal VT-User implementations shall be able to exploit the information conveyed via the Terminal Signal Titles Control Object in an appropriate manner to enhance the image presented to the human user, for example by providing pull-down menus of application functions or allowing the user to locally scroll through the terminal signal titles. The advantages of this control object are likely to be most apparent when dealing with large sets of terminal signals or when there is little correspondence between the terminal signals of interest to the application and the keys available on a real keyboard.

While the functionality provided is seen as most useful when applied to terminal signals having the 'Function Key' qualifier (i.e. the numbered Function Keys), it is available for use with all terminal signal values.

12.1 Data element values

The content of the Terminal Signal Titles Control Object is a set of Title Strings, each identified for update and reference purposes by an associated Terminal Signal value, and optionally, a Mnemonic to be assigned to the Terminal Signal value.

Each Title String is qualified by an optional component specifying the applicable character repertoire by position within the list of repertoires negotiated for use in Display Object updates. By default, the first repertoire in the list applies.

A Mnemonic may be assigned with or without an associated Title String. The semantic meaning of the Mnemonic value is outside the scope of this control object definition but must be understood by both Application and Terminal VT-Users.

The control object has no initial content.

12.2 Update Syntax

Defined as the ASN.1 type TSTCOupdate in the following ASN.1 module:

```
TITLE DEFINITIONS ::=

BEGIN

TSTCOupdate ::= SET OF TSTitem

TSTitem ::= SEQUENCE {
    signal      INTEGER,
    mnemonic    PRINTABLE STRING OPTIONAL,
    title       SEQUENCE {
      repertoire  INTEGER DEFAULT 1,
      text        OCTET STRING } OPTIONAL }

END
```

13 Additional information

This CO requires the use of the Enhanced Access Rules functional unit in S-mode operation.

14 Usage

An update in which the SET OF TSTitem is the empty set shall result in the discarding of all content of the TSTCO.

A TSTitem value in which the title field is omitted causes the existing title (if any) associated with the specified Terminal Signal to be discarded from the TSTCO.

A TSTitem value in which the mnemonic field is omitted causes the existing mnemonic (if any) associated with the specified Terminal Signal to be discarded from the TSTCO.

A TSTitem value in which the title field is present causes the existing title (if any) associated with the specified Terminal Signal to be replaced with the title supplied.

A TSTitem value in which the mnemonic field is present causes the existing mnemonic (if any) associated with the specified Terminal Signal to be replaced with the mnemonic supplied.

The mapping of keys to Terminal Signal values is outside the scope of this part of ISO/IEC ISP 11185.

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Annex A
(normative)

Profile Requirements List

A.1 Protocol requirements

This annex provides a Profile Requirements List (Profile RL) for the Profile FVT2114 specified in this part of ISO/IEC ISP 11185. This RL is to be used in conjunction with the Protocol ICS (PICS) proforma for the Virtual Terminal Protocol that is given in ISO/IEC 9041-2. The relationship between the Profile RL and the Protocol ICS is described in clause 5 of this part of ISO/IEC ISP 11185.

The requirements of this RL are given in tables A.1 and A.2. The notation used in the tables is as follows. Individual items in a PICS proforma are referenced by the means specified in 9.3.8.3 of ISO/IEC 9646-7. Such a reference has the form *x-y/z*, where *x* is the number of the ISO Standard that specifies the protocol, *y* is a reference within the PICS proforma of this Standard to the smallest subclause that contains the item concerned, and *z* is the reference number of the item within that subclause. Where this RL needs to present the constraints on a particular item as two or more separate cases, a suffix of the form '.*n*' is added to the item reference where *n* is a serial number that labels the different cases.

The item name is taken from the PICS proforma. The "status" columns of the RL tables take priority over the corresponding "status" columns of the PICS proforma and they use the notation of that proforma. They refine the PICS proforma status values by evaluating conditional expressions or converting optional values to a more specific form. The following conditional values are used in these tables:

c1 If 9041-A.2.2/1 then m else -
c2 if application implementation the m else -
c3 if terminal implementation the m else -

the referenced predicate from ISO/IEC 9041-2 is that S-mode is supported.

Where an RL table has a "Profile values" column, the status value applies separately to each listed Profile value. For example, in the case of the single item listed in table A.2, to satisfy this RL the answers in the SENDING column of the PICS proforma must have "y" in the "Support" column and must include at least values 0...65535 in the "Supported values" column.

For any column in an RL table that corresponds to an answer column in the PICS proforma, the values listed are the acceptable answers for the item concerned. The following special notation is used in these columns:

Any The RL places no constraint on the answer;
n/a The column is not relevant to this item.

A.2 Profile specific requirements

An RL may also specify constraints on the answers to additional questions that concern Profile-specific conformance requirements which are outside the scope of any referenced base standard. These questions will be given in the RL itself.

This RL does not specify any Profile-specific constraints.

Table A.1 — VTE requirements for FVT2114 (Terminal Signal Titles CO)

Item reference no. 9041-	Name of item	Status	Numbers supported	Negotiable
A.2.1/6	Enhanced Access-rules	c1	n/a	n/a
A.3.8/12	Non-parametric COs	m	>=1	Any

Table A.2— PDU requirements for FVT2114 (Terminal Signal Titles CO)

Item reference no. 9041-	Name of item	Profile values	SENDING Status	RECEIVING Status
A.5.15.4/16	other	see note	c2	c3
NOTE - Support is mandatory for the ASN.1 types defined for the module TITLE DEFINITIONS in subclause 12.2 of this part of ISO/IEC ISP 11185.				

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Annex B
(informative)

Terminal Signal Titles Example

This example assumes that the Terminal Signal Titles CO plus one or both of the Sequenced and Unsequenced Terminal CO types have been negotiated into the VTE.

It is further assumed that the VTE-profile restricts both the number of modifier flags and the number of base types supported by the Sequenced and Unsequenced Terminal COs to 3. In this example, the terminal implementation will set a single or combination of modifier flags upon depression of the corresponding modifier key or keys as follows:

Control	Set flag 1
Shift	Set flag 2
Alternate	Set flag 3

The terminal implementation will generate base values depending on the type of key used for input as follows:

Special labelled key	Base type 0
Numbered function key	Base type 1
Character key	Base type 2

Thus a wide range of potential terminal signal values may be generated by various key combinations as follows:

0 - 255	Single labelled
256 - 511	Single function
512 - 767	Single character
1024 - 1279	Control + labelled
1280 - 1535	Control + function
1536 - 1791	Control + character
2048 - 2303	Shift + labelled
2304 - 2559	Shift + function
2560 - 2815	Shift + character
3072 - 3327	Control, shift + labelled
3328 - 3583	Control, shift + function
3584 - 3839	Control, shift + character
4096 - 4351	Alternate + labelled
4352 - 4607	Alternate + function
4608 - 4863	Alternate + character
5120 - 5375	Control, alternate + labelled
5376 - 5631	Control, alternate + function
5632 - 5887	Control, alternate + character
6144 - 6399	Shift, alternate + labelled
6400 - 6655	Shift, alternate + function
6656 - 6911	Shift, alternate + character
7168 - 7423	Control, shift, alternate + labelled
7424 - 7679	Control, shift, alternate + function
7680 - 7935	Control, shift, alternate + character

NOTES

1. It is unlikely that the full range of values above would ever be generated within a single implementation since natural limitations, such as the number of keys available on the keyboard, would constrain the potential number of values.

2. It must be stressed that the assignment of modifier flags and base values to the key strokes above is purely for the purposes of this example. The mapping between keystrokes performed and terminal signal values generated is outside the scope of the Terminal Signal Titles CO. Indeed, a feature of the Terminal Signal Titles CO is that the terminal signal values can be reassigned.

The Terminal Signal Titles CO may be used by an application which requires to associate titles or mnemonics (or both) with any of the terminal signal values which may be generated.

For example, a descriptive text for each function key or function key combination which has semantic significance to the application could be down-loaded to the terminal implementation by updating the Terminal Signal Titles CO as illustrated here. (Note that the string .. indicates that some elements have been omitted). The second repertoire in the negotiated list within the VTE-profile is to be used for the descriptive text. In this example, the application also assigns the "PUP" mnemonic (see table B.1 below) to terminal signal 0.

```
TSTCOupdate{
        TSTitem{
                signal  0,
                mnemonic  "PUP"
                }
                {
                signal  256,
                 title{
                      repertoire  2,
                      text  "function 1 text"
                     }
                }
                {
                signal  257,
                 title{
                      repertoire  2,
                      text  "function 2 text"
                     }
                }
                .
                {
                signal  1280,
                 title{
                      repertoire  2,
                      text  "control + function 1 text"
                     }
                }
                .
        }
```


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The contents of the Terminal Signal Titles CO may be updated subsequently as application requirements change, e.g. if the semantic significance of function key 1 and the mnemonic associated with terminal signal value 0 were to change, the following updates could be applied:

```
TSTCOupdate{
        TSTItem
                {
                signal  0,
                mnemonic  "UA"
                }
                {
                signal  256,
                 title{
                      repertoire  2,
                      text  "new function 1 text"
                     }
                }
                {
                signal  1280,
                 title{
                      repertoire  2,
                      text  "new control + function 1
                            text"
                     }
                }
              }
```

The other TSTitems set up by the initial updates remain valid.

How and when the descriptive texts are displayed to the human user will be the responsibility of the terminal implementation. It is anticipated that such implementations will normally map how signal values are generated (eg. the keystrokes required) to their associated descriptive texts, avoiding the need to expose the signal values themselves to the human user.

In the case of special-purpose labelled keys, the keys themselves will already bear inscriptions which suggest the meaning of the keys. A VTE-profile may assign names to a range of base values which can be generated by the use of such keys eg. values 0-255 in this example. An ordered list of mnemonics could then be devised which correspond to those names. An application could then use the Terminal Signal Titles CO to reassign those mnemonics to specified terminal signal values.

Table B.1 below contains an ordered list of mnemonics which could be used.

Mnemonic	Description	Mnemonic	Description
BRK	Break	HOM	Home
BEL	Bell	END	End
BS	Back Space	PUP	Page Up
TAB	Tab	PD	Page Down
BTAB	Back Tab	PA1	Page to Window 1
LF	Line Feed	PA2	Page to Window 2
CR	Carriage Return	PA3	Page to Window 3
CAN	Cancel	HP	Help
SUB	Substitute	STP	Status Process
ESC	Escape	INTP	Interrupt Process
PLS	+ (Plus)	TERP	Terminate Process
MNS	- (Minus)	ABO	Abort Output
MULT	* (Multiply)	FF	Form Feed
DIV	/ (Divide)	CL	Clear
LA	Left Arrow	PRNT	Print
RA	Right Arrow	RFR	Refresh
UA	Upward Arrow	SYRQ	System Request
DA	Downward Arrow	EOR	End of Record
INS	Insert	EOF	End of File
DEL	Delete	SUSP	Suspend Process
INSL	Insert Line	ENT	Enter
DELL	Delete Line	CRLF	Carriage Return and Line Feed

Table B.1 - Suggested Mnemonics

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ICS 35.100

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