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INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 11187-4

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Information technology — International Standardized Profiles AVT1n, AVT2n — Virtual Terminal Basic Class — Application Profiles —

Part 4:
AVT23 — S-mode Paged Application Profile

Technologies de l'information — Profils normalisés internationaux AVT1n, AVT2n — Classe de base du terminal virtuel — Profils d'application —

Partie 4: AVT23 — Profil d'application mode S de paginés

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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 JTC 1. In addition to developing International Standards, ISO/IEC JTC 1 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 a 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 11187–4 was prepared with the collaboration of

— Asia–Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 11187 consists of the following parts under the general title *Information technology – International Standardized Profiles AVT1n, AVT2n – Virtual Terminal Basic Class – Application Profiles*:

— *Part 1: Common VT Protocol Requirements*

— *Part 2: Common Supporting Layers Requirements*

— *Part 3: AVT22 – S-mode Forms Application Profile*

— *Part 4: AVT23 – S-mode Paged Application Profile*

— *Part 5: AVT16 – A-mode Generalized Telnet Application Profile*

— *Part 6: AVT15 – A-mode Transparent Application Profile*

Annexes A to D form an integral part of this part of ISO/IEC ISP 11187.

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Introduction

ISO/IEC ISP 11187 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.

This International Standardized Profile contains the specification of Open Systems Interconnection (OSI) Application Profiles (A-profiles) defined within the framework of ISO/IEC TR 10000 for the Virtual Terminal Basic Class Service and Protocol that is specified in ISO 9040 and ISO 9041. To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given OSI specification. Such a statement is called an Implementation Conformance Statement (ICS). This International Standardized Profile also contains the specification of an ICS proforma for each specified Application Profile.

This part of ISO/IEC ISP 11187 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. The text is harmonized between these three Workshops and it has been ratified by the plenary assemblies of each Workshop.

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Information technology – International Standardized Profiles AVT1n, AVT2n – Virtual Terminal Basic Class – Application Profiles –

Part 4:
AVT23 - S–mode Paged Application Profile

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 Information Objects that provide these 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 therefore Information Objects that require explicit reference within the VT protocol. Particular instances of these Information Objects 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 objects 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 11187 is applicable to environments in which a terminal population requires access to application packages running on a variety of computers. It may be used where the connection between the terminal and the computer that hosts the application package is local, is made across a Local or Wide Area Network, or is made across a concatenation of such networks.

This part of ISO/IEC ISP 11187 contains the specification of the S-mode Paged Application Profile. Virtual Terminal implementations that operate in accordance with this A-profile provide powerful general-purpose terminal capabilities which are suitable in particular for form-filling applications. This A-profile specifies a mode of operation of, and a selection of options for use with, the S-mode Paged VTE-profile FVT122. These are together designed to provide versatility and to promote interoperability between Virtual Terminal implementations which support that VTE-profile.

This part of ISO/IEC ISP 11187 supports terminals, which allow to fill all fields on the screen (locally) and then send all data to the host at once. Such terminals communicate with the host not on character by character basis, but on the character stream basis. To send input data from this kind of terminal it is necessary to press one of special keys provided on the terminal.

This part of ISO/IEC ISP 11187 also specifies a Profile ICS proforma for the S-mode Paged Application Profile specified herein in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7. The supplier of an implementation which is claimed to conform to ISO/IEC ISP 11187-4 is required to complete a copy of the Profile ICS proforma as specified in 5.2 and is required to provide the information necessary to identify both the supplier and the implementation.

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

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in this International Standardized Profile are in the Virtual Terminal subclass of the class of Application Profiles.

A Profile within this subclass has a Profile identifier of the form AVT*ab*, where *ab* is a structured numerical identifier that identifies the position of the Profile within two levels of subdivision of the subclass. The value of *a* is a single digit but *b* 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 the permitted modes of operation of the Virtual Terminal Service as follows:

— a = 1 for Basic Class A-mode (asynchronous mode);

— a = 2 for Basic Class S-mode (synchronous mode).

Values of a greater than 2 are reserved for future developments.

ISO/IEC ISP 11187 contains the specifications of the Profiles with identifiers of the form AVT1*b* and AVT2*b*. The component *b* distinguishes between different Application Profiles that make use of the same mode of operation.

This part of ISO/IEC ISP 11187 contains the specification of the Application Profile with the Profile identifier

— AVT23 — S -mode Paged Application Profile.

1.3 Scenario

The VT Basic Class Service is defined in ISO 9040. It operates within the OSI Reference Model defined in ISO 7498 to provide facilities for interactive terminal-oriented communication between two application-processes. The aspects of an application-process that make use of these facilities constitute a VT-user as defined in ISO 9040. Figure 1 illustrates the elements of the OSI model that are concerned with communication between two VT-users in accordance with a VT Application Profile.

The VT-user component of an application-process (AP) communicates by invoking an application-entity (AE) to establish a VT-association with an application-entity of a peer application-process. In order provide the VT Basic Class Service to their VT-users, two AE-invocations (AEIs) exchange information by means of both the VT Basic Class Protocol specified in ISO 9041-1 and the ACSE Protocol specified in ISO 8650. The VT Basic Class Service enables the VT-users to exchange data that may include control information related to virtual terminal functions and to real devices.

In the model of the OSI Application Layer given in ISO/IEC 9545, the AE is a composition of two application-service-elements (ASEs) and a Control Function (CF). It is the CF that provides the VT Service to the VT-user. The ASEs are the VT ASE and the ACSE. In an AEI the CF provides the functions of the VT Service by making coordinated use of the services provided to it by invocations of each of the two ASEs. Each ASE-invocation (ASEI) in turn provides its services by an exchange of APDUs with its peer, for which it requires the use of the Connection-oriented Presentation Service. These requirements of the two ASEIs are passed to the CF, which coordinates them and makes the actual use of the Presentation Service.

An AEI operates in accordance with rules determined by an application-context. The definition of the application-context for a VT-association is provided by clause 11 of ISO 9041-1.

A VT Application Profile specifies constraints on the operation of an AEI within the application-context defined in ISO 9041-1. It also specifies constraints on the use of the Presentation Layer by such an AEI and on the consequent use of the Session Layer by the Presentation Layer. A VT Application Profile is intended to be used in conjunction with any Transport Profile (T-Profile) of ISO/IEC TR 10000-2 that provides a connection-mode Transport Service for use by the Session Layer.

A VT Application Profile may also specify constraints on the exchange of control information between the VT-users and on the behaviour of a VT-user in response to information exchanged.

An AP-invocation may make concurrent or consecutive use of more than one AE-invocation. An AE-invocation may be a partner in one or more application-associations, either concurrently or consecutively. A VT-association is an application-association capable of supporting communication between two VT ASEs.

The VT Application Profiles specified in ISO/IEC ISP 11187 are concerned solely with the operation of a VT-association. They place no constraint on any other application-associations of the AE-invocation concerned or on any other AE-invocation belonging to the AP-invocation concerned.

The VT Application Profile specified in this part of ISO/IEC ISP 11187 assumes an asymmetry between the two communicating end systems. One end system is assumed to possess a terminal device with facilities for the input and display of data by a human user. It may also possess a printer or other hard-copy device. These two devices form part of the VT-user component of that end system and are modelled within the data structures of the VT Service. 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 is recognised by the VT Service in accordance with 19.3.2 of ISO 9040. The VT-user of the end system with the real devices is designated as the Terminal VT-user, the other as the Application VT-user, and the two do not have equal access to the functions of the VT Service.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 11187. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this part of ISO/IEC ISP 11187 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 Interna-

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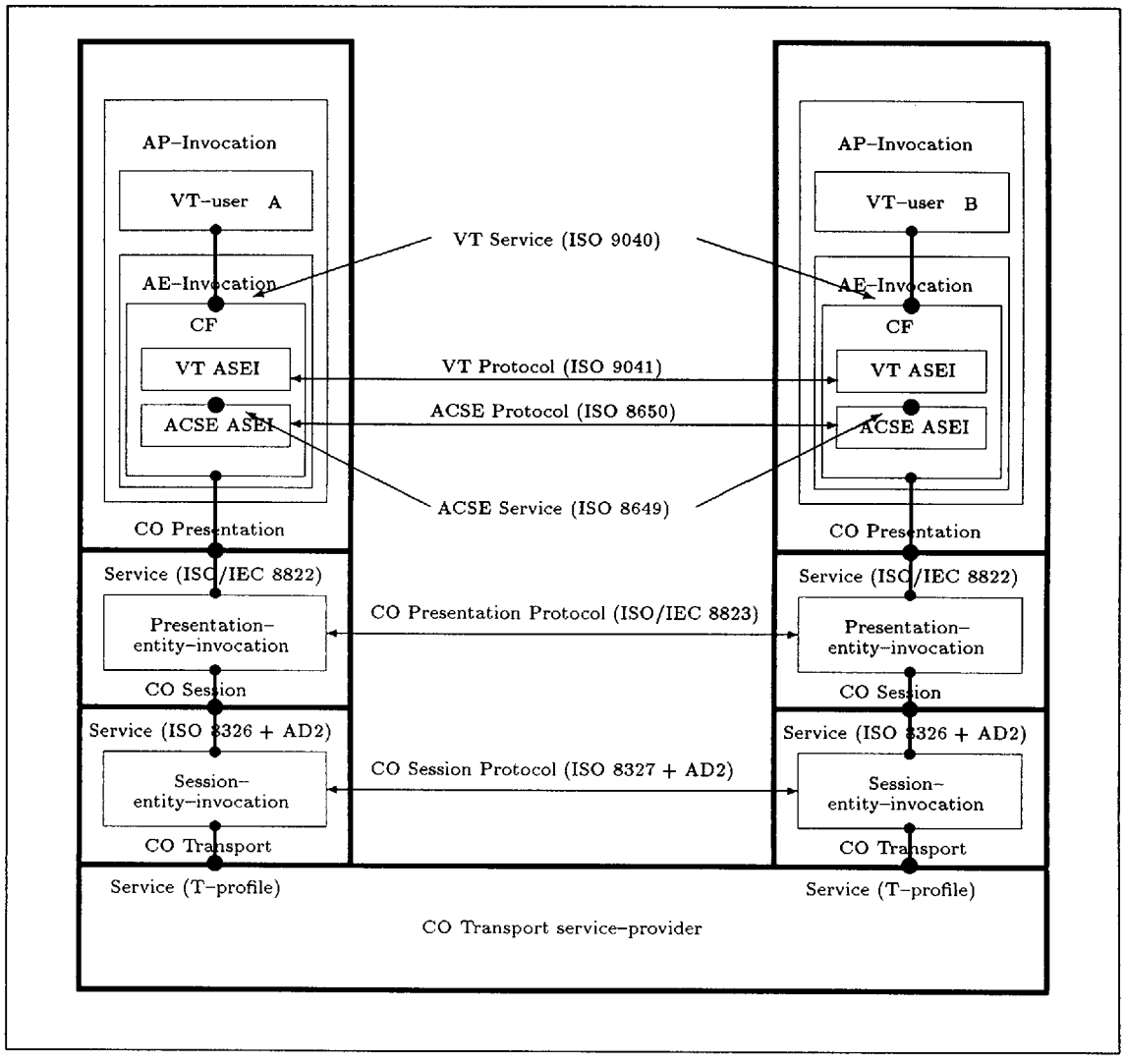

Figure 1 — Interactive VT communication between two end systems

tional Standards and ISPs, and ITU–T maintains published editions of its current Recommendations.

ISO/IEC 646:1991, *Information technology – ISO 7-bit coded character set for information interchange.*

ISO 2375:1985, *Data processing – Procedure for registration of escape sequences*[1].

ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model.* (See also Recommendation X.200.)

ISO 8326:1987, [2] *Information processing systems – Open Systems Interconnection – Basic connection oriented session service definition.* (See also CCITT Recommendation X.215.)

ISO 8327:1987, [2] *Information processing systems – Open Systems Interconnection – Basic connection oriented session protocol specification.* (See also CCITT Recommendation X.225.)

ISO/IEC 8327-2, [3] *Information technology – Open Systems Interconnection – Basic connection oriented session protocol specification – Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO 8649:1988, [2] *Information processing systems – Open Systems Interconnection – Service definition for the Association Control Service Element.* (See also CCITT Recommendation X.217.)

ISO 8650:1988, [2] *Information processing systems – Open Systems Interconnection – Protocol specification for the Association Control Service Element.* (See also CCITT Recommendation X.227.)

ISO 8650:1988/Amd.1:1990, *Information processing systems – Open Systems Interconnection – Protocol specification for the Association Control Service Element. Amendment 1.*

[1] The Registration Authority for ISO 2375 is the European Computer Manufacturers Association (ECMA), 114 rue du Rhône, CH–1204 Genève, Switzerland, from whom the corresponding register, the ISO *International register of Coded Character Sets to be used with Escape Sequences*, may be obtained.

[2] Currently under revision.

[3] To be published.

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ISO/IEC 8650-2:1995, *Information technology – Open Systems Interconnection – Protocol specification for the Association Control Service Element: Protocol Implementation Conformance Statement (PICS) proforma.*

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

ISO/IEC 8823-1:1995, *Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol specification.* (See also ITU–T Recommendation X.226.)

ISO/IEC 8823-2:1995, *Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol Implementation Conformance Statement (PICS) proforma.*

ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.* (See also ITU–T Recommendation X.680.)

ISO/IEC 8825-1:1995, *Information technology – ASN.1 encoding rules: – Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).* (See also ITU–T Recommendation X.690.)

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

ISO 9040:1990/Cor.1:1991, *Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Service. Technical Corrigendum 1.*

ISO 9040:1990/Cor.2:1992, *Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Service. Technical Corrigendum 2.*

ISO 9040:1990/Cor.3:1993, *Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Service. Technical Corrigendum 3.*

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

ISO 9041-1:1990/Cor.1:1992, *Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Protocol – Part 1: Specification. Technical Corrigendum 1.*

ISO 9041-1:1990/Cor.2:1993, *Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Protocol – Part 1: Specification. Technical Corrigendum 2.*

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 9545:1994, *Information technology – Open Systems Interconnection – Application Layer structure.* (See also ITU–T Recommendation X.207 (1993).)

ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.* (See also ITU–T Recommendation X.290.)

ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements.* (See also ITU–T Recommendation X.296.)

ISO/IEC 9834-4:1991, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities – Part 4: Register of VTE Profiles.*

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 10000-1:1995, *Information technology – Framework and taxonomy of International Standardized Profiles – Part 1: General principles and documentation framework.*

ISO/IEC TR 10000-2:1995, *Information technology – Framework and taxonomy of International Standardized Profiles – Part 2: Principles and Taxonomy for OSI profiles.*

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

ISO/IEC ISP 11184-1:1995, *Information technology – International Standardized Profiles FVT1nn – Virtual Terminal Basic Class – Register of VTE-profiles – Part 1: FVT121, FVT122 – S-mode Forms and Paged VTE-profiles.*

ISO/IEC ISP 11185-1:1994, *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.*

ISO/IEC ISP 11185-2:1994, *Information technology – International Standardized Profiles FVT2nn – Virtual Terminal Basic Class – Register of control object type definitions – Part 2: FVT213, FVT214 – Sequenced and Unsequenced Terminal Control Objects.*

ISO/IEC ISP 11185-6:1994, *Information technology – International Standardized Profiles FVT2nn – Virtual Terminal Basic Class – Register of control object type definitions – Part 6: FVT219 – Status Message Control Object.*

ISO/IEC ISP 11185-7:1994, *Information technology – International Standardized Profiles FVT2nn – Virtual Terminal Basic Class – Register of control object type definitions – Part 7: FVT2110 – Entry-Control Control Object.*

ISO/IEC ISP 11185-9:1994, *Information technology – International Standardized Profiles FVT2nn – Virtual Terminal Basic Class – Register of control object type definitions – Part 9: FVT222 – Paged FEICO (Field Entry Instruction Control Object) No.1.*

ISO/IEC ISP 11185-11:1994, *Information technology – International Standardized Profiles FVT2nn – Virtual Terminal Basic Class – Register of control object type definitions – Part 11: FVT232 – Paged FEPCO (Field Entry Pilot Control Object) No.1.*

ISO/IEC ISP 11187-1, [1] *Information technology – International Standardized Profiles AVT1n, AVT2n – Virtual Terminal Basic Class – Application Profiles – Part 1: Common VT Protocol Requirements.*

ISO/IEC ISP 11187-2, [1] *Information technology – International Standardized Profiles AVT1n, AVT2n – Virtual Terminal Basic Class – Application Profiles – Part 2: Common Supporting Layers Requirements.*

[1] To be published.

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ISO/IEC ISP 11188-1:1995, *Information technology – International Standardized Profile – Common upper layer requirements – Part 1: Basic connection oriented requirements.*

3 Definitions

For the purposes of this part of ISO/IEC ISP 11187, the following definitions apply.

3.1 General OSI terminology

3.1.1 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 7498–1:

a) application–entity;

b) application–process;

c) application–process–invocation;

d) real open system.

3.1.2 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 10731:

a) service primitive;

b) service–provider.

3.1.3 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 8824-1:

a) component type;

b) module;

c) object identifier;

d) sequence type;

e) sequence-of type;

f) set type;

g) set-of type;

h) structured type.

3.1.4 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 9545:

a) AE–invocation;

b) application–association;

c) application–context;

d) application–service–element;

e) ASE–invocation;

f) control function;

3.1.5 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 9646-1:

a) dynamic conformance requirement;

b) Implementation Conformance Statement;

c) Implementation Conformance Statement proforma;

d) Profile Requirements List;

e) Profile specific Implementation Conformance Statement;

f) Profile specific Implementation Conformance Statement proforma;

g) Protocol Implementation Conformance Statement;

h) Requirements List;

i) static conformance requirement.

3.2 Terminology of VT standards

3.2.1 This part of ISO/IEC ISP 11187 makes use of the terms defined in ISO 9040 and the following term defined in ISO 9041-1:

a) protocol element.

3.2.2 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC ISP 11185-11:

a) device control store;

b) device status store;

c) local action function;

d) local action operation;

e) logical entry location;

f) signal event.

4 Abbreviations

For the purposes of this part of ISO/IEC ISP 11187, the following abbreviations apply.

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ACSE	Association Control Service Element;
AE	Application–entity;
AEI	AE–invocation;
AP	Application–process;
APDU	Application–protocol–data–unit;
ASE	Application–service–element;
ASEI	ASE–invocation;
ASN.1	Abstract Syntax Notation One;
CF	Control function;
CO	Control object;
DO	Display object;
FEC	Field Entry Condition;
FEE	Field Entry Event;
FEI	Field Entry Instruction;
FEICO	Field Entry Instruction Control Object;
FEIR	Field Entry Instruction Record;
FEPCO	Field Entry Pilot Control Object;
FEPR	Field Entry Pilot Record;
FER	Field Entry Reaction;
ICS	Implementation Conformance Statement;
OSI	Open Systems Interconnection;
PDU	Protocol Data Unit;
PICS	Protocol Implementation Conformance Statement;
RIO	Reference Information Object;
RL	Requirements List;
SCS	System Conformance Statement;
TCCO	Termination Conditions Control Object;
VT	Virtual Terminal;
VTE	Virtual Terminal Environment;
VTPM	Virtual Terminal Protocol Machine.

5 Conformance

5.1 Conformance requirements

This part of ISO/IEC ISP 11187 provides a specification for the use of the Virtual Terminal protocol in combination with supporting upper layer OSI protocols, with a VTE-profile and with a number of VT control objects. The protocols are specified by International Standards, the VTE-profile and VT control objects are information objects specified by International Standardized Profiles in accordance with the taxonomy of ISO/IEC TR 10000-2. Where the specification of an information object delegates certain elements to a referencing Application Profile, the additional information required is specified in clause 6 of this part of ISO/IEC ISP 11187.

This part of ISO/IEC ISP 11187 distinguishes between terminal and application end systems in its requirements. It is applicable to a real open system that includes:

— an implementation of each OSI protocol listed in table 5.1;

— an application-process which implements the control of virtual terminal functions and real devices in accordance with the semantic definition of the information objects listed in table 5.2 and, in the case of a terminal implementation, also table 5.3.

Tables 5.2 and 5.3 specify VT information objects by their taxonomy identifiers as given in ISO/IEC TR 10000-2. The tables also give the general classification of the object within the taxonomy, together with a reference to the ISP part that contains the specification.

For an application implementation, implementation of the information objects lised in table 5.3 is optional, but if they are implemented then it shall be in accordance with the relevant semantic definition.

A system claiming conformance to this part of ISO/IEC ISP 11187 shall satisfy:

a) the conformance requirements contained in the specifications of each of the OSI protocols listed in table 5.1;

b) the conformance requirements contained in the specifications of each of the information objects listed in table 5.2 and, where appropriate, table 5.3;

c) the static conformance requirements specified in the RL given in annex A.

Table 5.1 — Protocols required

Protocol name	Protocol specification	PICS proforma specification
VT	ISO 9041-1:1990	ISO/IEC 9041-2:1993
ACSE	ISO 8650:1988	ISO/IEC 8650-2:1995
Presentation	ISO/IEC 8823-1:1995	ISO/IEC 8823-2:1995
Session	ISO 8327:1987	ISO/IEC 8327-2:–

Table 5.2 — Information objects required

Taxonomy identifier	Object type	ISO/IEC ISP Reference
FVT122	VTE-profile	11184-1:1995
FVT211	Miscellaneous CO	11185-1:1994
FVT212	Miscellaneous CO	11185-1:1994
FVT213	Miscellaneous CO	11185-2:1994
FVT214	Miscellaneous CO	11185-2:1994
FVT222	FEICO	11185-9:1994
FVT232	FEPCO	11185-11:1994

Table 5.3 — Additional information objects required for terminal implementation

Taxonomy identifier	Object type	ISO/IEC ISP Reference
FVT219	Miscellaneous CO	11185-6:1994
FVT2110	Miscellaneous CO	11185-7:1994

A system claiming conformance to this part of ISO/IEC ISP 11187 shall also exhibit external behaviour consistent with having implemented:

a) the virtual terminal protocol machine so as to support the VTE-profile FVT122 as a current-VTE (see A.2.1 of ISO 9041-1);

b) the relevant control objects listed in tables 5.2 and 5.3 in accordance with the CO values, syntax and semantics clause of each specification (ISO/IEC 9834-5 requires there to be such a clause) and with clause 15 of ISO/IEC ISP 11184-1;

c) the additional information object requirements of clause 6 of this part of ISO/IEC ISP 11187;

d) the constraints specified in the Profile Specific ICS proforma given in annex B;

e) the dynamic conformance requirements specified in 7.1.

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NOTE — Clause 14 of ISO 9040 permits, but does not require, the semantics of a CO to be specified as part of the registered type definition of the CO. Conformance requirements concerning the semantics of a CO are therefore included not in the CO type defnition but instead in a referencing Application Profile. The Profile makes explicit the relationships between the VT base standards and particular information objects, the specifications for which will include between them the semantic specification of each relevant CO.

A system claiming conformance as a terminal implementation shall also exhibit external behaviour consistent with having implemented:

a) the model of a terminal VT-user specified in 12.1 of ISO/IEC ISP 11185-11;

b) the local processing function of that model in accordance with 12.2 of ISO/IEC ISP 11185-11.

A system claiming conformance as a terminal implementation shall also include real devices that satisfy the requirements specified in 7.2 and 7.3.

5.2 Profile ICS proforma

In compliance with 6.5.4 of ISO/IEC 9646-7, a Profile ICS proforma for this part of ISO/IEC ISP 11187 shall consist of:

— the PICS proformas listed in table 5.1;

— the Profile RL specified in annex A of this part of ISO/IEC ISP 11187;

— the Profile Specific ICS proforma specified in annex B of this part of ISO/IEC ISP 11187.

A conforming Profile ICS proforma shall be technically equivalent to this specification and shall preserve the numbering and ordering of the items in each PICS proforma and the Profile Specific ICS proforma.

A Profile ICS which conforms to this specification shall:

a) describe an implementation which conforms to the Application Profile specification of ISO/IEC ISP 11187–4;

b) be a conforming ICS proforma, which has been completed in accordance with the instructions for completion given in the constituent questionnaires;

c) include the information necessary to uniquely identify both the supplier and the implementation.

6 Information object requirements

The definition of the VTE-profile FVT122 referenced in table 5.2 above is given in ISO/IEC ISP 11184-1. By 13.1 of that definition, if there is a mutual agreement between the two communicating VT-users to operate that VTE-profile in accordance with a specific VT Application Profile then a default value for a VTE-profile argument that is specified by the Application Profile takes precedence over the default value specified in the VTE-profile definition.

The type definitions of the FEICO FVT222 and FEPCO FVT232 referenced in table 5.2 above are given in parts 9 and 11 respectively of ISO/IEC ISP 11185. These definitions permit a referencing VTE-profile, and by delegation of authority consequently also a referencing Application Profile, to provide:

— semantic linkage between the FEICO, FEPCO and other COs that may be present in the VTE;

— a specification of the local action function that is accessed by certain FECs and FERs of the FEPCO;

— an initial content for the FEICO;

— an initial content for the FEPCO.

In accordance with clause 9 of ISO/IEC ISP 11184-1 and clause 6 of ISO/IEC ISP 11187-1, a mutual agreement to operate the VTE-profile FVT122 in accordance with the Application Profile AVT23 is created by the establishment of a full-VTE for which the VTE-profile name is the ASN.1 object identifier

```
{ iso standard 11187 1 profiles(1) 122 23 }.
```

This clause provides the specifications that apply when such a mutual agreement has been established.

6.1 Default values for VTE-profile arguments

6.1.1 This part of ISO/IEC ISP 11187 specifies default values for the four VTE-profile arguments of FVT122 that enable the use of additional registered control objects to be negotiated. These are:

```
r13  --  CO-name;
r14  --  CO-type-identifier;
r22  --  device-control-object for device "D";
r31  --  device-control-object for device "P".
```

The default values for all other optional VTE–profile arguments of FVT122 are as specified in clause 13 of ISO/IEC ISP 11184–1.

NOTE — All of the 32 VTE–profile arguments of FVT122 are optional with the exeption r12. The value of profile argument r12 specifies, to the VT service–provider, which of the two communicating VT–users has the terminal role. Since either VT–user can initiate the VT–association, this value cannot be determined by default.

6.1.2 The default value for an optional single–occurence VTE–profile argument is the value invoked when no value is specified for that argument in the response primitive of the negotiation service concerned. For multiple–occurence VTE–profile arguments, two situations arise. If such an argument has a determinate number of occurences then each occurence is treated for the purposes of default as if it were a single–occurence argument. If such an argument has an indeterminate number of occurences then additional occurences, with specific values, may be invoked by default even when the values for one or more occurences are specified in the response primitive. For such arguments a default value alone is not sufficient; a default procedure is required that specifies both the default value or values and the conditions under which they are invoked.

NOTE — The number of occurences of a multiple–occurence VTE–profile argument may be specified explicitly in the VTE–

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profile specification or may be determined by the value, or by the number of occurences, of another argument; both situations count as a determinate. The arguments listed in 6.1.1 are examples of arguments that have an indeterminate number of occurences.

6.1.3 Annex C of this part of ISO/IEC ISP 11187 specifies certain nodes of the ASN.1 object identifier tree that shall be recognised as identifying sub-registers of a register of CO type definitions in accordance with ISO/IEC 9834-5. The sub-registers correspond to the five major classifications of CO types, namely Miscellaneous COs, FEICOs, FEPCOs, RIOs and TCCOs.

The default invocations of the four VTE–profile arguments listed in 6.1.1 are all determined by the CO–type–identifier values included in the offers made, and the values returned, for r14. If either the offers made, or the values returned, include any CO–type–identifier value that is not in accordance with annex C then no occurences are invoked by default for any of the four VTE–profile arguments. Otherwise a separate default specification applies for each of the five major classifications of CO–types.

The default occurences for a particular classification are invoked when, and only when, no CO–type–identifier belonging to that classification is included in either the offers made, or the values returned, for r14. The default occurrences for each classification are specified in 6.1.4 to 6.1.6.

NOTE — It is necessary to require no offer, as well as no response, so that a response to an explicit offer may specify that it supports none of the offered COs of the classification concerned without at the same time invoking the default COs of that classification.

6.1.4 The default for the FEICO classification consists of the invocation of a single occurence for each of r13, r14 and r22 with the following values:

```
r13:  "EI"
r14:  { iso standard 9834 5 1 2 }
r22:  "EI"
```

There is no corresponding invocation of r31. This default designates a FEICO with the taxonomy type FVT222 that is linked to the main device.

6.1.5 The default for the FEPCO classification consists of the invocation of a single occurence for the each of r13, r14 and r22 with the following values:

```
r13:  "EP"
r14:  { iso standard 9834 5 2 2 }
r22:  "EP"
```

There is no corresponding invocation of r31. This default designates a FEPCO with the taxonomy type FVT232 that is linked to the main device.

6.1.6 The defaults for the Miscellaneous CO, RIO and TCCO classifications are empty; no occurences are invoked for any of r13, r22 and r31.

6.2 CO semantic linkages

In the model of the VT-user that is common to both parts 9 and 11 of ISO/IEC ISP 11185, the field-control object defined by 3.3 of ISO/IEC ISP 11184-1 shall be located in the device control store.

6.3 FEICO initial content

Table 6.1 — FEICO Initial Content

FEIR No	ASN.1 Value of FEIs
FEIR00	-- Not used --
FEIR01	optionalField
FEIR02	mandatoryField
FEIR03	protectedField
FEIR04	fillField
FEIR05	echoReceivedChar
FEIR06	echoOff
FEIR07	ignoreCase
FEIR08	inhibitLogRendAttOp
FEIR09	allowedCharacters: {{ lowValue {primaryValue '41'H, repertoire 1, attributes { }}, highValue '5A'H }} -- A,B,...,Z --
FEIR10	allowedCharacters: {{ lowValue {primaryValue '61'H, repertoire 1, attributes { }}, highValue '7A'H }} -- a,b,...,z --
FEIR11	allowedCharacters: {{ lowValue {primaryValue '30'H, repertoire 1, attributes { }}, highValue '39'H }} -- 0,1,...,9 --
FEIR12	disallowedCharacters: {{ lowValue {primaryValue '41'H, repertoire 1, attributes { }}, highValue '5A'H }} -- A,B,...,Z --
FEIR13	disallowedCharacters: {{ lowValue {primaryValue '61'H, repertoire 1, attributes { }}, highValue '7A'H }} -- a,b,...,z --
FEIR14	disallowedCharacters: {{ lowValue {primaryValue '30'H, repertoire 1, attributes { }}, highValue '39'H }} -- 0,1,...,9 --
FEIR15-FEIR127	-- Reserved --

NOTE — The character-box graphic elements referenced by FEIR09-FEIR14 will only be as indicated in the ASN.1 comments if the first occurence of the VTE–parameter repertoire–assignment takes either the ISO 9040 default value or some compatible value.

When the VTE includes, either by default or through explicit negotiation, a FEICO of type FVT222 with CO-name "EI" then it shall have the initial content that is specified in table 6.1. This specification is given in terms of ASN.1 value notation for a value of the type FEI as exported from the module ISP11185-FEICO2 defined in ISO/IEC ISP 11185-9. For each FEIR*nn*, *nn* is the FEIR-index value used to reference the FEIR in accordance with 20.3.4.2 of ISO 9040. This part of ISO/IEC ISP 11187 also requires that FEICO update operations shall use an FEIR-index value greater than 127.

NOTE — The character oriented FEIRs for the initial content utilise the default rendition attributes; see 12.6a) of ISO/IEC ISP 11185-9.

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6.4 FEPCO initial content

Table 6.2 — FEPCO Initial Content

FEPR No	Compt.	ASN.1 Description
FEPR00		-- Not used --
FEPR01	FEE	signalEvent: 0, 65535
	FEC	unconditional
	FER01	updateIntegerCO: name "ST", value currentSignal
	FER02	relinquishWAVAR
FEPR02	FEE	feiViolation
	FEC	unconditional
	FER	visualIndication
FEPR03	FEE	feiViolation
	FEC	unconditional
	FER	audibleIndication
FEPR04–FEPR127		-- Reserved --

When the VTE includes, either by default or through explicit negotiation, a FEPCO of type FVT232 with CO-name "EP" then it shall have the initial content that is specified in table 6.2. This specification is given in terms of ASN.1 value notation for values of the types FEE, FEC and FER as exported from the module ISP11185-FEPCO2 defined in ISO/IEC ISP 11185-11. For each FEPR*nn*, *nn* is the FEPR-index value used to reference the FEPR in accordance with 20.3.5.2 of ISO 9040. This part of ISO/IEC ISP 11187 also requires that FEPCO update operations shall use an FEPR-index value greater than 127.

7 Profile specific requirements

7.1 Negotiation of VTE-profile arguments

The requirements concerning the support of values for the 32 VTE-profile arguments of FVT122 follow from the VTE-parameter requirements given in tables A.2 to A.4 of the RL in annex A. This part of ISO/IEC ISP 11187 also specifies requirements concerning the usage of these VTE-profile arguments by the VT-ASSOCIATE and VT-SWITCH-PROFILE negotiation services defined in 28.1 and 30.1 of ISO 9040 respectively. These requirements differ between terminal and application implementations and between initiator and responder roles.

Any statements in the following specification of these usage requirements which describe the values that may be supported for the VTE–profile arguments are purely informative, the normative support requirements are those given in annex A.

NOTES

1 In certain cases the negotiation procedure specifies that an initiator shall make no offer for a particular VTE–profile argument. In all such cases the support requirements for the initiator, given in annex A, are fully prescribed, *i.e.* there are no optional values.

2 In certain cases the negotiation procedure specifies that the responder shall make no response for a particular VTE–profile ergument, *i.e.* shall not include a value for that argument in its response primitive. A default value is then invoked in accordance with annex A above. In all such cases the support requirements for the responder, given in annex C, require the default value to have mandatory support.

3 For multiple occurrence VTE-profile arguments, 28.1.3.9 of the VT service specification ISO 9040 permits independent offers of alternative values to be made for each occurrence. However, the VT protocol specification of ISO 9041-1 does not support independent offers in the cases of the arguments for colour and font. The following negotiation procedure is specified according to the support capabilities of the VT protocol. The relationship between offers and values for multiple occurrence VTE-profile arguments, and for related pairs of VTE-profile arguments, is specified in detail to avoid ambiguity.

4 The negotiation procedure ensures that a VT-association request between two conforming implementations will always be accepted, and that the values negotiated for display object and control object VTE-profile arguments will always be the values desired by the application VT-user if these are supported by the terminal VT-user.

7.1.1 The following VTE-profile arguments

```
r1  --  x-bound
r2  --  y-bound
r7  --  foreground-colour-capability
```

have a single occurence.

A terminal initiator shall make no offer. The application shall either make no response or shall respond with a value that has mandatory terminal support.

An application initiator shall make either no offer or an offer of a single value that has mandatory terminal support. If the application makes no offer then the terminal shall make no response. If the application offers a single value then the terminal shall respond with that value.

7.1.2 The following VTE-profile argument

```
r3  --  z-window
```

has a single occurence and takes an integer value. The support requirements for both terminal and application permit optional values to be supported, but they constrain the supported values to be a range of consecutive integers.

If a terminal initiator does not support optional values then it shall make no offer and the application shall make no response. If a terminal initiator supports optional values then it shall offer its range of supported values and the application shall respond with its choice from this range.

An application initiator shall either make no offer or shall offer a range of values that includes a value with mandatory terminal support. If the application makes no offer then the terminal shall make no response. If the application makes an offer then the terminal shall respond with the largest of the offered values that it supports.

7.1.3 The following VTE-profile arguments

```
r4  --  repertoire-assignment
r5  --  font-assignment
```

may each occur any number of times. The occurrences of r4 form an ordered list and there may be an ordered list of occurrences of r5 associated with each occurrence of r4. The associated 'capability' VTE-parameters are set implicitly to the number of occurrences in the appropriate list.

Offers similarly form ordered lists. An offer for a single oc-

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currence of r4 consists of an ordered list of alternatives. Each alternative consists of a value for r4 accompanied optionally by an ordered list of values for r5. If there are offers for more than one occurrence of r4 then these themselves form an ordered list.

If a terminal initiator does not support optional values for either argument then it shall make no offer and the application shall make no response.

If a terminal initiator supports optional values then it shall make an appropriate offer in its request. The application response for r4 shall consist of an ordered list of one or more values, each selected as one of the alternatives offered for a different occurrence in the request. There may be fewer values in the response than there were offered occurrences in the request and sequence order need not be preserved. If a particular value of r4 in the response corresponds to an alternative in the request that had no associated values for r5 then the response also shall have no associated values for r5. If a particular value of r4 in the response corresponds to an alternative in the request that had a list of associated values for r5 then the response also shall have a list of associated values for r5, consisting of one or more of the values in the offered alternative in which sequence order need not be preserved.

An application initiator may, but need not, make an offer. If it makes an offer then the last alternative in the list of alternatives for the first occurrence of r4 shall consist of a value for r4 that has mandatory terminal support, with no associated values for r5. If the application makes no offer then the terminal shall make no response.

If an application makes an offer, the terminal response for r4 shall consist of an ordered list of one or more values, each selected as one of the alternatives offered for a different occurrence in the request. There may be fewer values in the response than there were offered occurrences in the request but sequence order shall be preserved. If a particular value of r4 in the response corresponds to an alternative in the request that had no associated values for r5 then the response also shall have no associated values for r5. If a particular value of r4 in the response corresponds to an alternative in the request that had a list of associated values for r5 then the response also shall have a list of associated values for r5, consisting of one or more of the values in the offered alternative in which sequence order shall be preserved.

The terminal response shall be the maximal response that it can support in a manner that is consistent with this procedure.

NOTES

1 There is in fact only one value of r4 that has mandatory terminal support. This designates a repertoire consisting only of GL–set and for which the GL–set is the IRV of ISO/IEC 646:1991. This set has ISO 2375 Registration No. 6. It differs from the IRV of the previous editions of ISO/IEC 646, which has Registration No. 2.

2 An application initiator that desires to negotiate the use of the IRV of ISO/IEC 646:1991 with one or more specific fonts as the first occurrence of r4 should include an offer for this repertoire and its associated fonts separately from the required inclusion of his repertoire with no associated fonts. The VT Service precludes the omission of a value in the response whenever a corresponding offer was made in the request and the value "device-dependent" for r5 cannot be offered explicitly, it can only be adopted by default.

7.1.4 The following VTE-profile argument

```
r6  --  DO-emphasis
```

occurs eight times in an ordered list. Successive occurrences specify VTE-parameter values for the eight emphasis subattributes "a" to "h" in accordance with 15.1.2 of ISO/IEC ISP 11184-1. Each occurrence is an ASN.1 printable string. The values permitted for each occurrence differ, but a terminal implementation is required to support all permitted values. The following requirements apply separately to each permitted occurrence; the protocol provides a mechanism to make an offer for a particular occurrence without necessarily making an offer for each preceding occurrence.

A terminal initiator shall make no offer. The application either may make no response or may respond with any permitted value.

An application initiator shall make either no offer or an offer of a single value composed of allowed characters. If the application makes no offer then the terminal shall make no response. If the application offers a single value then the terminal shall respond with that value.

7.1.5 The following VTE-profile arguments

```
r8  --  foreground-colour-assignment
r9  --  background-colour-assignment
```

each occur in an ordered list for the number of times specified by the value of r7. The values permitted for each occurrence are the same and a single offer is made that applies to all occurrences.

NOTE — Each occurence has a different default value as specified in 13.2 of ISO/IEC ISP 11184–1. These default values are invoked for each occurence for which the explicit value is present in the negotiation response primitive.

A terminal initiator shall make no offer. The application either may make no response or may respond for each of the first n occurrences with a value that has mandatory terminal support, where n does not exceed the value of r7.

An application initiator shall make either no offer or an offer which consists of values that have mandatory terminal support. If the application makes no offer then the terminal shall make no response. If the application makes an offer then the terminal shall respond with the first offered value for the first occurrence, the second offered value for the second occurrence, and so on either until the number of occurrences specified equals the value of r7 or until all offered values are included.

7.1.6 The following VTE-profile argument

```
r10  --  max-field-elements
```

has a single occurence.

A terminal initiator shall make no offer. The application either shall make no response or shall respond with a value that has mandatory terminal support.

An application initiator shall make either no offer or an offer

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of exactly one value that has mandatory terminal support. If the application makes no offer then the terminal shall make no response. If the application offers a single value then the terminal shall respond with that value.

Annex D describes the use of field–elements in this part of ISO/IEC ISP 11187.

7.1.7 The following VTE-profile argument

```
r11  --  access-outside-fields
```

has a single occurence. The support requirements for both terminal and application require one mandatory value, and permit one optional value, to be supported.

If a terminal initiator does not support the optional value then it shall make no offer and the application shall make no response. If a terminal initiator supports both values then it shall offer both values and the application shall respond with its choice.

An application initiator shall either make no offer or shall offer both values. If the application makes no offer then the terminal shall make no response. If the application offers both values then the terminal shall respond with the optional value if it supports that value, otherwise with the mandatory value.

7.1.8 The following VTE-profile argument

```
r12  --  CO-access for CO-name "UA"
```

is mandatory and has prescribed values.

A terminal initiator shall offer the single value "WACA" and the application shall respond with this value.

An application initiator shall offer the single value "WACI" and the terminal shall respond with this value.

7.1.9 The following VTE-profile arguments

```
r13  --  CO-name
r14  --  CO-type-identifier
```

may each occur any number of times. The occurrences of r13 form an unordered list and there is exactly one occurrence of r14 associated with each occurrence of r13. There may be occurrences of additional un-numbered VTE-profile arguments also associated with each occurrence of r13, corresponding to CO VTE-parameters whose values are not determined by the CO type specification referenced by the value of r14. Conceptually these form an integral part of r14. The support requirements for both terminal and application require particular combinations of values to be supported, and permit the support of additional optional combinations of values.

Each offer for r13 specifies a single value that is an ASN.1 printable string. The associated offers for r14 and any additional CO VTE-parameters each consist of a list of offered values.

If a terminal initiator does not support optional COs then it shall make no offer. If a terminal initiator does support additional COs then it shall offer all optional COs that are supported. Offers shall be constructed as follows. For each value offered for r13, the offer for r14 shall contain exactly one CO–type–identifier value together with an unordered list of alternatives for any additional VTE–profile arguments required by the CO type concerned.

The application either shall make no response or shall respond with values for COs that may be selected from either or both of the following:

— the COs that have mandatory terminal support;

— the COs, if any, that were offered explicitly by the terminal.

Each CO specified in the response is identified by the value assigned for r13. For each CO, the response shall also include the offered value for r14 and a value selected from those offered for each other argument for which an offer was made.

An application initiator either shall make no offer or shall offer one or more COs. Offers shall be constructed as follows. For each value offered for r13, the offer for r14 shall contain exactly one CO–type–identifier value together with an ordered list of alternatives for any additional VTE–profile arguments required by the CO type concerned.

If the application makes no offer then the terminal shall make no response. If the application makes an offer then the terminal shall respond with values for each CO offered that the terminal supports. Each CO specified in the response is identified by the value assigned for r13. For each CO, the response shall also include the offered value for r14 and a value for each other argument for which an offer was made, selecting the first supported alternative in each offered list of alternatives.

NOTES

1 In responding to offers received in a request primitive, both terminal and application should take account of the possible invocation of additional COs by default. The default procedure is specified in 6.1.3 above. It can have consequences even when there are COs whose usage is negotiated explicitly.

2 If an application offers a CO that has mandatory terminal support and has VTE–parameters determined by additional VTE–profile arguments, the offer may not always be acceptable by the terminal. Its acceptance is assured only if each offer for an additional argument itself includes a value that has mandatory terminal support.

7.1.10 The following VTE-profile arguments

```
r15  --  device-repertoire-assignment for device
         "D"
r16  --  device-font-assignment for device "D"
```

may each occur a number of times. Each occurrence of r4 has a corresponding occurrence of r15, each occurrence of r5 has a corresponding occurrence of r16.

NOTE — These device VTE-parameters are available to the application VT-user for information only. This part of ISO/IEC ISP 11187 requires an application to support all syntactically correct values for these VTE–parameters. An application implementation may support a value merely by accepting and discarding it. It does not need to be able to interpret the value concerned.

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Offers for these arguments have the same structure of ordered lists as offers for r4 and r5. Such offers shall be interpreted as being in correspondence with the offers made for r4 and r5. An ordered list in the offer structure for r15 and r16 shall either be absent or shall be the same length as the corresponding ordered list in the offer structure for r4 and r5. If a request includes no offer for r4 then it shall include no offer for r15, and similarly in a given context for r5 and r16.

A terminal initiator that makes an offer for r4 and r5 may, but need not, make an offer for r15 and r16. If it makes no offer then the application shall make no response. If it makes an offer then an application shall respond with the values that are determined by the correspondence described above; this correspondence leaves no freedom once the response for r4 and r5 is determined.

An application initiator shall make no offer. The terminal may, but need not, make a response. There are no constraints on the values that the terminal may specify in its response.

7.1.11 The following VTE-profile argument

```
r17  --  device-emphasis for device "D"
```

occurs eight times in an ordered list. Successive occurrences specify VTE-parameter values for the eight emphasis subattributes "a" to "h" in accordance with 15.1.3 of ISO/IEC ISP 11184-1. Each occurrence is an ASN.1 printable string. The values permitted for each occurrence differ, but an application implementation is required to support all permitted values. The following requirements apply separately to each permitted occurrence; the protocol provides a mechanism to make an offer for a particular occurrence without necessarily making an offer for each preceding occurrence.

A terminal initiator shall make either no offer or an offer of a single value composed of allowed characters. If the terminal makes no offer then the application shall make no response. If the terminal offers a single value then the application shall respond with that value.

An application initiator shall make no offer. The terminal either may make no response or may respond with any permitted value.

7.1.12 The following VTE-profile arguments

```
r18  --  device-foreground-colour-assignment
         for device "D"
r19  --  device-background-colour-assignment
         for device "D"
```

each occur in an ordered list for the number of times specified by the value of r7. The values permitted for each occurrence are the same and a single offer is made that applies to all occurrences.

NOTE — These device VTE-parameters are available to the application VT-user for information only. This part of ISO/IEC ISP 11187 requires an application to support all syntactically correct values for these VTE-parameters. An application implementation may support a value merely by accepting and discarding it. It does not need to be able to interpret the value concerned.

A terminal initiator may, but need not, make an offer. If it makes no offer then the application shall make no response. If it makes an offer then the application shall respond with a value for each of the r7 defined occurrences, each value being one of the offered values; sequence order need not be preserved and repetitions are permitted.

An application initiator shall make no offer. The terminal either may make no response or may respond for each of the first n occurrences where n does not exceed the value of r7. There are no constraints on the values that the terminal may specify in its response.

7.1.13 The following VTE-profile arguments

```
r20  --  device-minimum-x-array-length for
         device "D"
r21  --  device-minimum-y-array-length for
         device "D"
```

have a single occurence and take integer values. The support requirements for both terminal and application permit optional values to be supported; for the terminal they constrain the supported values to be a range of consecutive integers, for the application there is no such constraint.

If a terminal initiator does not support optional values then it shall make no offer. The application shall either make no response or shall respond with a value that has mandatory terminal support. If a terminal initiator supports optional values then it shall offer its range of supported values and the application shall respond with its choice from this range.

An application initiator shall either make no offer or shall offer an ordered list of one or more values, the last of which has mandatory terminal support. If the application makes no offer then the terminal shall make no response. If the application makes an offer then the terminal shall respond with the first of the values in the offered list that it supports.

7.1.14 The following VTE-profile argument

```
r22  --  device-control-object for device "D"
```

may occur a number of times. Each occurrence shall be a CO-name specified by an occurrence of r13. An offer for an occurrence of r22 consists of a list of alternatives for that occurrence.

For each offer that a terminal or application initiator makes for r13, it may, but need not, also offer that value of r13 as one of the alternatives for an occurrence of r22. The response may include, as a value for an occurrence of r22, any value that was included in the corresponding offer for r22 and which is also included as a value for r13.

NOTES

1 This mechanism permits a terminal to offer, for example, two or more FEICOs or FEPCOs but to specify that only one may be linked to the display device.

2 Additional occurences of this VTE-profile argument may be invoked by default; see 6.1.3.

7.1.15 The following VTE-profile argument

```
r23  --  special VTE-profile argument "Pp-1"
```


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has a single occurence and takes one of the boolean values "true" and "false".

A terminal initiator shall either make no offer or shall offer both permitted values. If the terminal makes no offer then the application shall make no response. If the terminal offers both values then the application shall respond according to its requirements.

An application initiator shall either make no offer or shall offer both permitted values. If the application makes no offer then the terminal shall make no response. If the application offers both values then the terminal shall respond with the value "true" if the secondary device is available at the terminal end system; see 7.3.1. Otherwise it shall respond with the value "false".

7.1.16 VTE-profile arguments r24 to r31 are available if, and only if, the value of r23 is "true". They correspond for optional device "P" to the arguments r15 to r22 for mandatory device "D".

The negotiation procedure for r24 to r31 shall be identical to that for r15 to r22.

NOTE — Although the negotiation procedure is identical, the default values differ for the two device objects.

7.1.17 The following VTE-profile argument

```
r32  --  special VTE-profile argument "Pp-2"
```

has a single occurence and takes one of the boolean values "true" and "false".

A terminal initiator shall either make no offer or shall offer the value "true". If the terminal makes no offer then the application shall respond according to its requirements. If the terminal offers the value "true" then the application shall respond with "true".

An application initiator shall make no offer. The terminal shall either make no response, or shall respond with the value "true".

NOTE — The terminal shall respond with the value "true" if it is not able to display the content of certain array elements of a field; see 13.2 of ISO/IEC 11184-1.

7.2 Device requirements for the main device

The real device represented by device object "D" shall form part of the terminal end system. It is identified as the main device. It shall include the capabilities of an object updating device (as defined by 3.3.18 of ISO 9040) as well as the capabilities represented by the VTE-parameters of the device object.

7.2.1 The main device shall be able to generate updates to the content of each array element of each active field within the update window for the z-dimension of the DO, subject to such constraints as may be imposed by the entry-controls of the field concerned; see 19.1.1.3 and 20.3.3.3 of ISO 9040.

7.2.2 When the value negotiated for the VTE-parameter "access-outside-fields" is "allowed" then the main device shall be able to generate updates to the content of all array elements within the update window for the z-dimension of the DO, subject to the access restrictions specified in 15.6.1 of ISO/IEC ISP 11184-1.

7.2.3 The main device shall be able to generate updates in accordance with 7.2.1 and 7.2.2 corresponding to all values for the attributes of those elements that are consistent with the values of the DO VTE-parameters for the current-VTE, see 13.2 of ISO 9040, and with field entry-controls when applicable.

7.2.4 The main device shall be able to generate updates to the Sequenced and Unsequenced Terminal COs, as specified in 14.1 of ISO/IEC ISP 11184-1, subject only to the access restrictions specified in 15.6.2 of ISO/IEC ISP 11184-1.

7.2.5 The main device shall be able to generate updates in accordance with 7.2.4 corresponding to all values that are specified in the Profile specific ICS as supported for the Sequenced and Unsequenced Terminal COs.

7.2.6 The main device shall be able to generate signal events, recognised as FEEs by the local processing function, corresponding to all values specified in the Profile specific ICS as supported for the Sequenced and Unsequenced Terminal COs; see 3.4.10 and 12.4.1 of ISO/IEC ISP 11185-11.

7.2.7 When the value negotiated for the VTE-parameter "access-outside-fields" is "allowed" then the main device shall be able to toggle the field-control variable between the values "on" and "off"; see 3.3 of ISO/IEC ISP 11184-1.

7.2.8 The main device shall be capable of displaying an image that makes the content of those DO array elements wihin the update window for the z-dimension available to the user of the terminal end system in accordance with the values of the device object VTE-parameters for the current-VTE, see clause 23 of ISO 9040, and with such constraints as may be imposed by FEIRs linked to the fields of the DO.

7.2.9 If, as a result of the values assigned to device object VTE-parameters for attributes, the image displayed by the main device does not uniquely represent the content of DO array elements then the device shall provide a means by which the content can be made available without ambiguity to the user of the terminal end system.

NOTE — The content need only be made available in unambiguous form for a single array element at a time. A monochrome terminal may, for example, make the colour attribute available by displaying the name of the colour when requested to do so in some implementation-specific manner.

7.2.10 If the image displayed by the main device does not make available simultaneously the content of all DO array elements within the update window for the z-dimension

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then the device shall provide a means of scrolling the image through the DO to enable all such array elements to be imaged.

7.3 Device requirements for the secondary device

When present, the real device represented by device object "P" shall form part of the terminal end system. It is identified as the secondary device. It shall not contain the capabilities of an object updating device.

7.3.1 The device object "P" shall be invoked through the use of VTE-profile argument r23 only if an appropriate secondary device is present in the terminal end system.

7.3.2 The secondary device shall be a device capable of creating a permanent record of the content of display object array elements, in accordance with the values of the device object VTE-parameters for the current-VTE and with such constraints as may be imposed by FEIRs linked to the fields of the DO.

NOTE — The secondary device will typically be a printer, but a file storage device may also satisfy the requirements.

7.3.3 As y-arrays at higher values of the z-coordinate are updated, lower numbered y-arrays move out of the update window for the z-dimension and so can no longer be updated. When the secondary device is turned on by the device default CO, see 15.5 of ISO /IEC ISP 11184-1, it shall record the content of each y-array as it moves out of the update window.

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Annex A

(normative)

Profile Requirements List

A.1 General

A Requirements List for a VT Application Profile specifies those static conformance requirements of the Application Profile that concern OSI protocols. In so doing, it provides the information required to determine whether or not a protocol exchange between two real open systems is consistent with the systems being conformant to those requirements.

This annex provides the Profile Requirements List (Profile RL) for the VT Application Profile AVT23 specified in this part of ISO/IEC ISP 11187, in compliance with ISO/IEC 9646-7.

This RL expresses restrictions upon answers allowed in the PICS proforma specified by:

— ISO/IEC 9041-2:1993;

which applies to the VT protocol specified by

— ISO 9041-1:1990;

— ISO 9041-1:1990/Cor.1:1992;

— ISO 9041-1:1990/Cor.2:1993.

This RL incorporates by reference, as nested RLs, that contained in the following ISP:

— ISO/IEC ISP 11187-1:[1)]

and those contained in the specifications of each VT information object that is claimed, in the Profile Specific ICS for this Application Profile, to be supported by the implementation.

A.2 Notation

A.2.1 Item references

Each table entry in this RL corresponds to an item in the PICS proforma of ISO/IEC 9041-2 as referenced above. Individual items in the proforma are referenced by the means specified in 9.5 of ISO/IEC 9646-7. Such a reference has the form y/z where y is a reference within the ICS proforma to the smallest subclause that contains the item concerned and z is the reference number of the item within that subclause.

A.2.2 Item names

Each table entry in this RL includes the item name that is given in the PICS proforma of ISO/IEC 9041-2. For PDU parameters these item names correspond to ASN.1 types, or to the identifiers of named types, that are used in the specification of the structure of VT PDUs given in clause 12 of ISO 9041-1.

A.2.3 Negotiation capabilities

Each table entry in this RL for a VTE-parameter specifies whether or not that VTE-parameter is negotiable. This is informative; the normative requirement is provided by the specifications of the VT information objects referenced by this profile, in accordance with 5.4.3 of ISO/IEC ISP 11187-1.

A.2.4 Normative references

Each table entry in this RL for a PDU parameter may optionally contain a reference to additional normative requirements that are given in the body of the specification to which this RL is annexed.

NOTE — The status values in an RL are themselves normative requirements of the profile that do not require reference to static conformance requirements given elsewhere in the profile specification; see A.5.3 of ISO/IEC TR 10000-1. This is in contrast to the situation for an ICS proforma as specified in 8.3 of ISO/IEC 9646-7, so that the reference columns serve different purposes in these two contexts.

A.2.5 Status columns

The status value assigned to a capability in the PICS proforma determines the support answers that are permitted for an implementation that is claimed to conform to the base standard. It also determines the implications of the answers for a test of conformance to the base standard.

Status values specified in this RL may strengthen those specified in the PICS proforma for an implementation that is claimed to conform to the profile. This strengthening may refer to the permitted answers, or to the implications for conformance testing, or both.

NOTE — The incorporation of nested RLs occurs similarly. When two RLs both specify a status value for the same capability, the strongest one applies.

A.2.5.1 PICS support answers

The support columns in the PICS proforma are used to specify whether or not a particular capability is claimed to be supported. When the PICS proforma is being completed as part of an ICS for this Application Profile, the following notation should be used wherever possible, in accordance with ISO/IEC 9646-7:

'yes' or 'y' the capability is claimed to be supported;

[1)] To be published.

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'no' or 'n' the capability is claimed to be not supported;

'n/a' or '–' no answer is being given.

Depending on the context, no answer means either that an answer is logically meaningless or that no claim is being made as to the level of support.

The above notation differs from that specified in the PICS proforma itself. Where the answers 'y', '–' and 'Ig' would be given as defined in the PICS proforma, the corresponding appropriate answers as defined above are 'yes', 'no' and 'n/a' or equivalents; see A.2.5.5 in particular concerning support of syntax but not semantics. The notation of ISO/IEC 9646-7 used above postdates that of the PICS proforma, is more precisely defined and no answer, *i.e.* 'n/a', is permitted in situations where none of the notations defined in the PICS proforma is appropriate.

A.2.5.2 Profile status notation

The columns headed 'Status' or 'Sts' in this RL specify Profile status values. The following notation is used in these status columns:

m mandatory — this capability shall be supported. The only support answer permitted is "yes" (or equivalent).

o optional — this capability may, but need not, be supported. The support answers permitted are "yes", "no" and "n/a" (or equivalents). For the purposes of conformance testing, an answer "no" should be treated as if the answer were "n/a".

i irrelevant, out-of-scope — this capability may, but need not, be supported. The support answers permitted are "yes", "no" and "n/a" (or equivalents). For the purposes of conformance testing, answers "yes" and "no" should be treated as if the answer were "n/a".

x excluded — this capability shall not be supported. The only support answer permitted is "no" (or equivalent).

– not applicable — the dynamic conformance requirements of the base standards are such that this capability is not available in the context concerned, so that the question of its support does not arise. The only support answer permitted is "n/a" (or equivalent).

Where the status of a capability is dependent on whether or not some other capability is supported, the following additional conventions are used:

c<integer> — conditional status;

o.<integer> — restricted optional status.

A conditional status is a status that involves a prerequisite. Its scope is a single item and it evaluates to one of the above status values according to the value of a predicate. The conditional expression is given in a footnote to the table concerned.

A restricted optional status is a status that involves a co-requisite. Its scope is a group of items within a single table, each of which is individually optional but where there is a restriction on the set of permitted support answers. The integer identifies a unique group of options and the corresponding restriction is given in a footnote to the table concerned.

NOTE — The period in the status notation o.<integer> signifies that the restriction applies jointly to all items with the same integer. In contrast, if a status c<integer> is assigned to more than one item in the same table then it applies individuall to each item. This notation follows 9.2 of ISO/IEC 9646-7.

The status values of subparameters are indented to correspond to the pattern of the item names; see A.2.2. The status value given for a subparameter is conditional on the support of the parent parameter, *i.e.* the closest preceding parameter with one fewer level of indent, otherwise the subparameter is not applicable. This follows the conventions adopted in the PICS proforma.

Where the status values given in a table, or a section of a table, are conditional on the values taken by one or more parameters then the condition is specified by a predicate given at the head of the table or section concerned.

NOTE — Such prerequisites arise when parameters play the part of identifier fields for classes of information object; see 3.6 of ISO/IEC 8824-2. At the time of preparation of ISO 9041-1 this extension of ASN.1 to permit formal definition of clases of information object was not available, so the nature of such parameters remains implicit in the VT protocol specification.

A.2.5.3 Interpretation of 'supported'

For a functional unit, support means that the functions of the unit are implemented and available for use in accordance with the protocol specification.

For a VTE-parameter, support means that the VT protocol machine supports the Existence status 'Defined' for that VTE-parameter; see A.2.1 of ISO 9041-1.

For a PDU, support means that the PDU is capable of being sent or received, according to the role concerned, in the context of supported functional units.

For a PDU parameter, support means that the implementation is capable of handling the parameter, *i.e.* sending or receiving it according to the role concerned, for the value range specified in the PICS as supported. The capability to send the parameter does not require the parameter to be present in every instance of the PDU concerned. The capability to receive the parameter includes taking such action as is required in accordance with the semantics of the received value.

NOTE — The action appropriate to the semantics of a received parameter value is often simply to pass the decoded value transparently to the service user.

A.2.5.4 Interpretation of 'not supported'

A support answer of "no" is a specific statement that a capability is not supported.

If a VTE-parameter is not supported, the VT protocol machine supports only the value 'Undefined' for the Existence status of that VTE-parameter; see A.2.1 of ISO 9041-1.

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If a functional unit is not supported, it means that the functions of the unit are not available for use, either through not being implemented or through being explicitly disabled.

The VT protocol has no PDUs for which a support answer of "no" is valid.

If a PDU parameter is not supported in a sending role, it means that the parameter will not be present in any instance of the PDU concerned that is generated by the implementation.

If a PDU parameter is valid according to the protocol specification, a claim that it is not supported in a receiving role can occur within this profile only if the parameter is excluded from being sent by a conforming peer implementation; see clause A.3. If the parameter is received, the implementation may either reject the PDU or may accept it and respond correctly to it within the protocol specification; see 7.4.3.1 of ISO/IEC 9646-6. If it accepts the PDU then the implementation is operating outside of this profile; the peer implementation is necessarily not conformant to the profile. Such acceptance is not a case of non-conformance, nor shall it be considered to contradict the claim that the parameter is not supported when the implementation is configured to this profile.

NOTE — Some VT PDUs have parameters whose use is conditionally invalid according to the protocol specification, such as those for the negotiation of VTE-parameter values that are not permitted arguments of the VTE-profile concerned. It is a protocol error if an implementation receives a VT PDU that includes such an invalid parameter.

A.2.5.5 Interpretation of 'no answer'

If the status of a capability permits an answer 'n/a' then an implementation may provide partial support for the capability, for which neither "yes" nor "no" would be a correct description. Any behaviour that is permitted by the protocol specification is also permitted by the profile; in particular the capability may be fully supported.

For a capability that has separate sending and receiving roles, this support answer can occur in a receiving role within this profile only if the parameter is excluded from being sent by a conforming peer implementation; see clause A.3. In this context it should be used if the syntax, but not the semantics, is supported for receiving, a situation for which the notation 'Ig' is specifically defined in the support notation of the PICS proforma.

A.2.6 Value columns

In principle there is no distinction between a PDU parameter and a parameter value, since for a parameter whose value is a value of a structured ASN.1 type, each component type appears in the PICS proforma as a subparameter with its own status value. However, a PICS specifies the status values and support answers for parameter values in a different manner than that for other capabilities.

A.2.6.1 PICS proforma allowed values

The PICS proforma includes 'allowed values' and 'supported values' columns for VTE-parameters and, separately in both sending and receiving roles, for PDU parameters. The 'allowed values' columns specify the values that are permitted to be included in the 'supported values' columns of the completed PICS.

The entries in the 'allowed values' columns of a PICS proforma shall be interpreted as assigning a status value 'optional' to each allowed value. All other values of the ASN.1 type concerned are prohibited according to the protocol specification. Where the PICS proforma does not contain an entry in the 'allowed values' column, all values of the ASN.1 type concerned shall be considered as allowed.

NOTE — The PICS proforma does not contain entries in the 'allowed values' columns for structured types, such as sequence-of and set-of types, if the protocol places restrictions only on the component types that have separate entries in the PICS proforma. Nevertheless this RL may place constraints on the permitted size of such sequences and sets, so the concept of allowed values is still required.

A.2.6.2 Profile values

A.2.6.2.1 Status notation for values

This RL may modify the status of an allowed value, as it may do for any other capability. Since a profile status may be assigned independently to each allowed value, an abbreviated notation is used in this RL as follows.

A status symbol is prefixed to a set of values. If it is one of the basic status values 'm', 'o', 'x' or 'n/a' then it applies individually to each member of the set; there is no implication for values not in the set. If it is a reference to a conditional expression of the form c<integer> then it applies individually to each member of the set but the referenced expression may also assign a status value to all allowed values not in the set. If it is a reference of the form o.<integer> to an expression of restricted optional status then its scope is the specified set of values but again the referenced expression may also assign a status value to all allowed values not in the set.

NOTE — A restricted option may, for example, be used to specify that at least one value in the set shall be supported and that all values not in the set are excluded.

It is sometimes convenient to specify the scope of a restricted option by exclusion, so that the restriction applies to the allowed values that are not in the specified set. In this case a modified notation is used in this RL, of the form <status>.<integer>, where <status> is the basic status value that applies to the remaining values, *i.e.* those that are in the specified set.

NOTE — A restricted option of the form m.<integer> may, for example, be used to specify that support for all values in a specific range of consecutive integer values is mandatory and that all other values are optional but with the requirement that the supported values, including the mandatory ones, shall all be consecutive.

This notation is also used in the case in which the restriction on the optional values is the extreme one of them all being excluded.

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A.2.6.2.2 Specification of value sets

The status notation described in A.2.6.2.1 requires a notation for the specification of subsets from the set of allowed values. In this RL, different notations are used in the case of VTE-parameter values and PDU parameter values.

Values for VTE-parameters are given in the notation defined in A.2 of ISO 9040 for the definition of VTE-profiles. Subsets of values are defined by giving an explicit list separated by commas.

A PDU parameter takes values of a specific ASN.1 type. A subset of the allowed values is specified by an ASN.1 element set specification in the notation of clause 39 of ISO/IEC 8824-1, the parent type being the type defined in the protocol specification for the parameter concerned.

NOTE — The RL may use an element set specification to specify size constraints on ASN.1 sequence-of and set-of types even though the PICS proforma does not contain a corresponding entry in the allowed values column.

A.2.6.3 PICS supported values

The entries in the 'supported values' columns of a PICS shall be interpreted as assigning a support answer 'yes' to each listed value. The support answer implied for an allowed value that is not in the list of supported values depends as follows on the status assigned to the value concerned:

— a support answer 'no' is assigned to each value for which the status is 'excluded';

— a support answer 'n/a', *i.e.* no answer, is assigned to each value for which the status is 'optional' or 'out-of-scope'.

A.2.6.4 Interpretation

The interpretation of the support answers for PDU parameter values is as specified in A.2.5.3 to A.2.5.5 for PDU parameters, for reasons given above.

A support answer "yes" for a negotiable VTE-parameter value means that the implementation always offers this value, either explicitly or by default, in negotiation for this VTE-parameter and that it always accepts this value when offered. For a non-negotiable VTE-parameter it implies that the implementation supports this value if it is assigned to that VTE-parameter in accordance with the VTE-profile specification.

NOTE — This profile specifies that omission of an offer for a particular VTE-profile argument is to be interpreted as a default offer of all the values that have mandatory support, within the profile, for the terminal or application role as appropriate.

A support answer "no" for a negotiable VTE-parameter value means that the implementation does not offer this value in a negotiation of VTE-parameter values; if it accepts this value when offered by a non-conforming peer implementation then it is operating outside of the profile. For a non-negotiable VTE-parameter it implies that the implementation does not support this value if it is assigned to that VTE-parameter in accordance with the VTE-profile specification.

A support answer "n/a" for a VTE-parameter value places no constraint on the ability of the implementation to offer, accept or support this value, whether the value is determined by negotiation or otherwise.

A.3 Asymmetric requirements

The static conformance requirements of a profile may be different with respect to different roles, such as sending/receiving or initiating/responding. For example, a profile may require an implementation to be able to receive, and to respond correctly, to a wider range of values for a PDU parameter than may be sent to it by a conforming peer implementation. By 7.4.3 of ISO/IEC 9646-6 and 6.6.3 of ISO/IEC TR 10000-1, a profile shall clearly identify, for each conformance requirement, whether there is, or is not, an asymmetry. If there is asymmetry, the profile shall identify the asymmetric requirements.

This RL specifies no requirements that are asymmetric between initiator and responder roles, other than those already contained in the base standards.

This RL identifies an asymmetry between the protocol requirements of systems operating in terminal and application roles. The requirements in each role are specified separately in the tables of the RL.

This RL identifies an asymmetry between sending and receiving. Its requirements in a sending role are specified explicitly in the tables of the RL. It places no explicit requirements on a protocol implementation in a receiving role beyond those contained in the base standards. According to A.3.2.1 of ISO/IEC 9646-7, support of a PDU parameter is defined as being able to handle, in send and receive mode, the syntax of the parameter, its definition, its value range and other characteristics, and to use the parameter contents or its semantics to take an action. A terminal or application implementation shall be considered to satisfy these requirements if it can handle in this manner the entire range of values that may be sent to it by a conforming application or terminal implementation respectively, namely all values that are not explicitly excluded for sending.

NOTES

1 A protocol base standard may specify requirements concerning behaviour on reception of a parameter value that is outside the range permitted by the base standard. These requirements still apply for conformance to any profile that includes the protocol concerned.

2 The behaviour of an implementation is undefined if it receives a parameter value that is prohibited by a profile but permitted by the base standard; see A.2.5.4. By 7.4.3.1 of ISO/IEC 9646-6, in a test of conformance the means of testing shall only exhibit "in profile" behaviour and shall not attempt to coerce the receiving system under test to operate outside of the profile. This implies for this part of ISO/IEC ISP 11187 that the means of testing shall not send parameter values to an implementation under test that are excluded from being sent by a conforming peer implementation.

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A.4 VT service options

Table A.1 gives requirements concerning VT functional units that are additional to those given in ISO/IEC ISP 11187-1.

Table A.1 — Functional units

Item ref. (9041-2)	Feature	Sts
A.2.1/4	Urgent Data	o
A.2.1/5	Break	m
A.2.1/8	Blocks	i
A.2.1/10	Reference	m

A.5 VT environment parameters

Tables A.2 to A.7 below specify static conformance requirements concerning the VT environment parameters that are listed in A.3 of the PICS.

Table A.2 — Support requirements for VTE display, control and device objects

Item ref. (9041-2)	Name of item	Value	TERMINAL	APPLICATION
			Status	Status
A.3.1/1	display-object-name	A	m	m
A.3.7.13/1	device-name	D	m	m
A.3.7.13/1	device-name	P	m	o
A.3.8.1/1	CO-name	UA	m	m
A.3.8.1/1	CO-name	EI	m	m
A.3.8.1/1	CO-name	EP	m	m
A.3.8.1/1	CO-name	SM	m	o
A.3.8.1/1	CO-name	EC	m	o

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Table A.3 — VTE Parameter requirements for display object

Item ref. (9041-2)	Name of item	Negotiable	TERMINAL		APPLICATION	
			Sts	Values	Sts	Values
Prerequisite (for display-object-name): A.3.1/1 = A						
A.3.1/8	max-field-elements	Yes	m	m.1: 1, "unbounded"	m	o.1: 1, "unbounded"
A.3.1/9	access-outside-fields	Yes	m	m: "not allowed"	m	m: "not allowed"
A.3.4/2	x-bound	Yes	m	o.2: 1..6164	m	o.4: 1..6164
A.3.4/6	y-bound	Yes	m	o.3: 1..6164	m	o.5: 1..6164
A.3.4/13	z-window	Yes	m	m.2: 1	m	m.2: 1
A.3.7.1/1	repertoire-capability	No	m	m.2: 1	m	m.2: 1
A.3.7.1/2	repertoire-assignment	Yes	m	m.3: See table A.5	m	m.4: See table A.5
A.3.7.1/3	font-capability	No	m	m.2: 1	m	m.2: 1
A.3.7.1/4	font-assignment	Yes	m	m.3: See table A.5	m	m.4: See table A.5
A.3.7.1/5	emphasis	Yes	m	m.5: See table A.5	m	o.8: See table A.5
A.3.7.1/6	foreground-colour-capability	Yes	m	m.1: 1..8	m	o.6: 1..8
A.3.7.1/7	foreground-colour-assignment	Yes	m	m.3: See table A.5	m	m.4: See table A.5
A.3.7.1/8	background-colour-capability	No	m	m.1: 1..8	m	o.7: 1..8
A.3.7.1/9	background-colour-assignment	Yes	m	m.3: See table A.5	m	m.4: See table A.5

m.1:	It is mandatory to support all the values in the set, all values not in the set are excluded.
m.2:	It is mandatory to support all the values in the set, all smaller values are excluded, all greater values are optional but all values from the minimum mandatory value to the greatest supported optional value shall be supported.
m.3:	It is mandatory to support all the values in the set for all occurrences, all values not in the set are optional but the values supported for each occurence shall all be the same.
m.4:	It is mandatory to support all the values in the set for the first occurrence, all values not in the set are optional and the values supported for each occurrence need not be the same.
m.5:	It is mandatory to support all allowed values for each occurrence.
o.1:	It is mandatory to support at least one of the values in the set, all values not in the set are excluded.
o.2,o.3:	It is mandatory to support all pairs of values in these sets which, separately and when multiplied together, do not exceed 6164; all pairs of values that violate this condition are excluded.
o.4,o.5:	It is mandatory to support at least one pair of values in these sets which, separately and when multiplied together, do not exceed 6164; all pairs of values that violate this condition are excluded.
o.6,o.7:	It is mandatory to support at least one value in each set, the values supported in both sets shall be the same.
o.8:	It is mandatory to support at least one of the allowed values for each occurrence.

Table A.4 — VTE Parameter requirements for device objects

Item ref. (9041-2)	Name of item	Negotiable	TERMINAL		APPLICATION	
			Sts	Values	Sts	Values
Prerequisite (for device-name): A.3.7.13/1 = D						
A.3.7.13/6	repertoire-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/7	font-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/8	emphasis	Yes	m	o.1: See table A.5	m	m.3: See table A.5
A.3.7.13/9	foreground-colour-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/10	background-colour-assign't	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/11	minimum-x-array-length	Yes	m	m.4: 1..80	m	m: 80
A.3.7.13/12	minimum-y-array-length	Yes	m	m.4: 1..24	m	m: 24
A.3.7.13/13	control-object	Yes	m	m: "EI","EP","SM"	m	o: "EI", "EP"
Prerequisite (for device-name): A.3.7.13/1 = P						
A.3.7.13/6	repertoire-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/7	font-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/8	emphasis	Yes	m	o.1: See table A.5	m	m.3: See table A.5
A.3.7.13/9	foreground-colour-assignment	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/10	background-colour-assign't	Yes	m	m.1: "null"	m	m.2: "null"
A.3.7.13/11	minimum-x-array-length	Yes	m	m.4: 1..80	m	m: 80
A.3.7.13/12	minimum-y-array-length	Yes	m	m.4: 1..24	m	m: 24

m.1:	It is mandatory to support this symbolic value for all occurrences, all other allowed values are optional but the values supported for each occurrence shall be the same.
m.2:	It is mandatory to support this symbolic value for all occurrences, all other allowed values are also mandatory for all occurrences.
m.3:	It is mandatory to support all allowed values for each occurrence.
m.4:	It is mandatory to support all the values in the set, all smaller values are excluded, all greater values are optional but all values from the minimum mandatory value to the greatest supported optional value shall be supported.
o.1:	It is mandatory to support at least one of the allowed values for each occurrence.

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Table A.5 — Values referenced by VTE requirements for display and device objects

Item ref. (9041-2)	Item name	Profile entry	
A.3.7.4 – Repertoire and Font Support	Repertoire name	Graphic characters of the International Reference Version of ISO/IEC 646:1991 (ASCII)	
	Standard name	ISO 9040 default scheme based on ISO 2022	
	Register reference ISO 2022 only – up to four escape sequences	ISO 2375 Registration No.6 ESC 2/8 4/2	
	List of fonts supported	Only ISO 9040 device-dependent default	
A.3.7.7 – Emphasis Support	If other schemes are supported give a detailed description of each such scheme	As specified in 15.1 of ISO/IEC ISP 11184-1. This scheme has eight subattributes labelled "a" through "h". The following subattribute values are defined. Successive occurrences of the VTE-parameter refer to successive subattributes. The allowed values for an occurrence of the DO-emphasis VTE-parameter are all ASN.1 PrintableString values composed of zero or more characters listed below for the appropriate subattribute. The allowed values for an occurrence of the device-emphasis VTE-parameter are constructed in the same manner except that the string values are not permitted to include a 'space' character.	
		subattribute "a" values	"B", "F", "N", " "
		subattribute "b" values	"U", "D", "N", "O", " "
		subattribute "c" values	"S", "F", "N", " "
		subattribute "d" values	"N", "P", " "
		subattribute "e" values	"D", "N", " "
		subattribute "f" values	"C", "N", " "
		subattribute "g" values	"I", "F", "N", " "
		subattribute "h" values	"F", "C", "N", " "
A.3.7.10 – Colour Support	Item	Foreground Colour	Background Colour
	Colour scheme name	None	None
	Standard name	ISO 9040 default scheme based on ISO 6429	ISO 9040 default scheme based on ISO 6429
	Register reference (if any)	None	None
	List of colours	The allowed values for each occurrence are: black, red, green, yellow, blue, magenta, cyan, white	The allowed values for each occurrence are: black, red, green, yellow, blue, magenta, cyan, white

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Table A.6 — VTE Parameter requirements for Control Objects

Item ref. (9041-2)	Name of item	Negotiable	TERMINAL		APPLICATION	
			Sts	Profile values	Sts	Profile values
Prerequisite (for CO-name): A.3.8/1 = UA						
A.3.8.1/2	CO-type-identifier	Yes	m	m.1: {1 0 9834 5 0 2} --FVT212	m	m.1: {1 0 9834 5 0 2} --FVT212
A.3.8.1/4	CO-access	Yes	m	c1: "WACA" c2: "WACI"	m	c1: "WACI" c2: "WACA"
Prerequisite (for CO-name): A.3.8/1 = EI						
A.3.8.1/2	CO-type-identifier	Yes	m	m.1: {1 0 9834 5 2 2} --FVT222	m	m.1: {1 0 9834 5 2 2} --FVT222
Prerequisite (for CO-name): A.3.8/1 = EP						
A.3.8.1/2	CO-type-identifier	Yes	m	m.1: {1 0 9834 5 3 2} --FVT232	m	m.1: {1 0 9834 5 3 2} --FVT232
Prerequisite (for CO-name): A.3.8/1 = SM						
A.3.8.1/2	CO-type-identifier	Yes	m	m.1: {1 3 16 2 7 0 0 2} --FVT219	m	m.1: {1 3 16 2 7 0 0 2} --FVT219
A.3.8.1/3	CO-structure	No	m	m.2: 3	m	m.3: 3
A.3.8.1/4	CO-access	Yes	m	m.1: same as FDC0	m	m.1: same as FDC0
Prerequisite (for CO-name): A.3.8/1 = EC						
A.3.8.1/2	CO-type-identifier	Yes	m	m.1 {1 3 16 2 7 0 0 3} --FVT2110	m	m.1 {1 3 16 2 7 0 0 3} --FVT2110
A.3.8.1/4	CO-access	Yes	m	m.1: same as FDC0		m.1: same as FDC0

m.1:	It is mandatory to support this value, all other values are excluded.
m.2:	It is mandatory to support this value, all smaller values are excluded, all greater values are optional but all values from the minimum mandatory value to the greatest supported optional value shall be supported.
m.3:	It is mandatory to support this value, all smaller values are excluded, all greater values are optional.
c1:	IF initiator role supported THEN m ELSE x.
c2:	IF responder role supported THEN m ELSE x.

Table A.7 — VTE Parameter requirements for Control Object Data Elements

Item ref. (9041-2)	Name of item	Negotiable	TERMINAL		APPLICATION	
			Sts	Profile values	Sts	Profile values
Prerequisite (for CO-name and CO-element-id): A.3.8.1/1 = SM and A.3.8.2/1 = 1						
A.3.8.2/4	CO-size	Yes	m	m.1: 0,1	m	m: 0
Prerequisite (for CO-name and CO-element-id): A.3.8.1/1 = SM and A.3.8.2/1 = 2						
A.3.8.2/4	CO-size	Yes	m	m.1: 0,1	m	m: 0
Prerequisite (for CO-name and CO-element-id): A.3.8.1/1 = SM and A.3.8.2/1 = 3						
A.3.8.2/3	CO-repertoire-assignment	Yes	m	m: See table A.5	m	m: See table A.5

m.1:	It is mandatory to support all values in this set, all smaller values are excluded, all greater values are optional but all values from the minimum mandatory value to the greatest supported optional value shall be supported.

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A.6 VT PDUs and PDU parameters

The profile requirements concerning the VT PDUs and PDU parameters listed in A.4 and A.5 of the PICS are specified in the Common Requirements List of ISO/IEC ISP 11187-1.

A.7 Lower level negotiation elements

Tables A.8 to A.19 below specify static conformance requirements concerning the lower level negotiation elements that are listed in A.6 of the PICS.

Table A.8 — Profile Argument Offer List requirements

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (VTE-profile-name for AVT23): A.5.2/8 or A.5.24/1 = {iso standard 11187 profiles(1) 122 23}						
A.6.1/1	specialProfileArgums	7.1.15 & 7.1.17	m	m.1: SIZE (1)	o	m.1: SIZE (1)
A.6.1/2	identifier		m	m.1: 1 | 2	m	m.1: 1
A.6.1/3	boolean		m	m.1: {true,false} | true	m	m.1: {true,false}
A.6.1/7	vteParams		m		m	
A.6.1/8	displayObjects		o		o	
A.6.4/2	name		m	m.1: "A"	m	m.1: "A"
A.6.4/3	ParameterOffers		m	See table A.10	m	See table A.10
A.6.1/9	controlObjects		m		m	
A.6.7/2	name		m	m: "UA"	m	m: "UA"
A.6.7/3	ParameterOffers		m	See table A.14	m	See table A.14
A.6.1/10	deviceObjects		o		o	
A.6.10/2	name		m	o.1: "D" | "P"	m	o.1: "D" | "P"
A.6.10/3	ParameterOffers		m	See table A.18	m	See table A.18

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.

Table A.9 — Profile Argument Value List requirements

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (Use of AVT23; see 9041-1 A.2.2.2): Vena = TRUE, current-VTE = {iso standard 11187 1 profiles(1) 122 23}						
A.6.2/1	specialProfileArgums	7.1.15 & 7.1.17	m	m.1: SIZE (1)	m	m.1: SIZE (1)
A.6.2/2	identifier		m	m.1: 1 | 2	m	m.1: 1
A.6.2/3	boolean		m	m.1: TRUE | FALSE	m	o.1: TRUE | FALSE
A.6.2/7	vteParams		m		m	
A.6.2/8	displayObjects		m		m	
A.6.5/2	name		m	m.1: "A"	m	m.1: "A"
A.6.5/3	ParameterValues		m	See table A.11	m	See table A.11
A.6.2/9	controlObjects		m		m	
A.6.8/2	name		m	m: "UA"	m	m: "UA"
A.6.8/3	ParameterValues		m	See table A.16	m	See table A.16
A.6.2/10	deviceObjects		m		m	
A.6.11/2	name		m	m.1: "D" | "P"	m	m: "D" c1: "P"
A.6.11/3	ParameterValues		m	See table A.19	m	See table A.19

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.
c1:	IF (TRUE supported for A.6.2/3) THEN m ELSE x, all non-mandatory values are excluded.

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Table A.10 — CDS Offer requirements

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
	Prerequisite: A.6.4/2 = "A"					
A.6.4/5	xParamOffer		x		o	
A.6.4.1/1	bound	7.1.1	-		m	
A.6.12/1	limit IntegerOffer		-		m	m.1: SIZE (1)
A.6.12/2	individualValue		-		m	o.2: 1..6164
A.6.12/3	range		-		x	
A.6.4/6	yParamOffer		x		o	
A.6.4.1/1	bound	7.1.1	-		m	
A.6.12/1	limit IntegerOffer		-		m	m.1: SIZE (1)
A.6.12/2	individualValue		-		m	o.3: 1..6164
A.6.12/3	range		-		x	
A.6.4/7	zParamOffer		o		o	
A.6.4.1/4	window	7.1.2	m		m	
A.6.12/1	limit IntegerOffer		m	m.1: SIZE (1)	m	m.1: SIZE (1)
A.6.12/2	individualValue		x		x	
A.6.12/3	range		m		m	
A.6.12/4	minimum		m	m.1: 1	m	m.1: 1
A.6.12/5	maximum		m	x: 1	m	x: 1
A.6.4/9	repertoireOfferList	7.1.3	o	See table A.11(A)	o	See table A.11(A)
A.6.4/10	emphasisOfferList	7.1.4	x		o	o.1: SIZE (1..8)
A.6.4.1/20	strings		-		m	o.1: SIZE (1)
A.6.4/11	foregroundColourOffer		x		o	
A.6.4.1/21	colourCapability	7.1.2	-		m	
A.6.12/1	IntegerOffer		-		m	m.1: SIZE (1)
A.6.12/2	individualValue		-		m	o.1: 1..8
A.6.12/3	range		-		x	
A.6.4.1/22	colourValues	7.1.5	-		m	See table A.11(B)
A.6.4/12	backgroundColourOffer		x		o	
A.6.4.1/22	colourValues	7.1.5	-		m	See table A.11(B)
A.6.4/15	fieldParams		m		m	
A.6.4.1/28	maxFieldElements	7.1.6	x		m	o.1: {unbounded NULL} | {limit {indiv: 1}}
A.6.4.1/29	accessOutside	7.1.7	o	m.1: {allowed,notAllowed}	o	m.1: {allowed,notAllowed}

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.
o.2,o.3:	It is mandatory to support at least one pair of values from these sets which, separately and when multiplied together, do not exceed 6154; all pairs of values that violate this condition are excluded.

Table A.11 — Common offer requirements

Item ref. (9041-2)	Name of item	Normative ref.	SENDING	
			Sts	Values
	Prerequisite: where referenced as table A.11(A)			
A.6.4.1/B	CompoundRepertoireOffer	7.1.3		
A.6.4.1/6	SEQ OF RepertoireFontOffer		m	
A.6.4.1/8	SEQ OF SEQ		m	
A.6.4.1/9	repertoire		m	m: {value iso2022: {'2842'H}}
	Prerequisite: where referenced as table A.11(B)			
A.6.4.1/22	colourValues	7.1.5		o.1 SIZE (1..8)
A.6.4.1/23	type		x	
A.6.4.1/24	iso6429		m	o.1: "black" | "red" | "green" | "yellow" | "blue" | "magenta" | "cyan" | "white"
A.6.4.1/25	isonnnn		x	

o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.

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Table A.12 — CDS Value requirements

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite: A.6.5/2 = "A"						
A.6.5/5	xParamValues		m		m	
A.6.5.1/1	bound	7.1.1	m	o.4: WITH CPTS {limit (1..6164)}	m	o.2: WITH CPTS {limit (1..6164)}
A.6.5/6	yParamValues		m		m	
A.6.5.1/1	bound	7.1.1	m	o.5: WITH CPTS {limit (1..6164)}	m	o.3: WITH CPTS {limit (1..6164)}
A.6.5/7	zParamValues		m		m	
A.6.5.1/4	window	7.1.2	m	m.2: limit: 1	m	m.2: limit: 1
A.6.5/9	repertoire		m		m	
A.6.5.1/6	SEQ OF RepertoireFontValue	7.1.3	m	m: {{{value iso2022: {'2842'H}}}}	m	m: {{{value iso2022: {'2842'H}}}}
A.6.5/10	emphasis	7.1.4	m	m.1: SIZE (1..8)	m	o.1: SIZE (1..8)
A.6.5/11	foregroundColour		m		m	
A.6.5.1/21	colourCapability	7.1.2	m	m.1: 1..8	m	o.1: 1..8
A.6.5.1/22	colourValues	7.1.5	m	See table A.13(B)	m	See table A.13(A)
A.6.5/12	backgroundColour		m		m	
A.6.5.1/22	colourValues	7.1.5	m	See table A.13(B)	m	See table A.13(A)
A.6.5/15	fieldParams		m		m	
A.6.5.1/28	maxFieldElements	7.1.6	m	m.1: unbounded: NULL | limit: 1	m	o.1: unbounded: NULL | limit: 1

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
m.2:	It is mandatory to support all the values of the set, all smaller values are excluded, all greater values are optional but all values from the minimum mandatory value to the greatest supported optional value shall be supported.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.
o.2,o.3:	It is mandatory to support at least one pair of values from these sets which, separately and when multiplied together, do not exceed 6154; all pairs of values that violate this condition are excluded.
o.4,o.5:	It is mandatory to support all pairs of values from these sets which, separately and when multiplied together, do not exceed 6154; all pairs of values that violate this condition are excluded.

Table A.13 — Common value requirements

Item ref. (9041-2)	Name of item	Normative ref.	SENDING	
			Sts	Values
Prerequisite: where referenced as table A.13(A)				
A.6.5.1/22	colourValues	7.1.5		o.1 SIZE (1..8)
A.6.5.1/23	type		x	
A.6.5.1/24	iso6429		m	o.1: "black" | "red" | "green" | "yellow" | "blue" | "magenta" | "cyan" | "white"
A.6.5.1/25	isonnnn		x	
Prerequisite: where referenced as table A.13(B)				
A.6.5.1/22	colourValues	7.1.5		m.1 SIZE (1..8)
A.6.5.1/23	type		x	
A.6.5.1/24	iso6429		m	m.1: "black" | "red" | "green" | "yellow" | "blue" | "magenta" | "cyan" | "white"
A.6.5.1/25	isonnnn		x	

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.

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Table A.14 — CSS Offers

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (CO-name for FVT212): A.6.7/2 = "UA"						
A.6.7/4	typeIdentifier	7.1.8	m	m.1: {{1 0 9834 5 0 2}}	m	m.1: {{1 0 9834 5 0 2}}
A.6.7/7	access	7.1.8	m	m.1: {waca}	m	m.1: {waci}
Prerequisite (CO-name for FVT222): A.6.7/2 = "EI"						
A.6.7/4	typeIdentifier	7.1.9	m	m.1: {{1 0 9834 5 1 2}}	m	m.1: {{1 0 9834 5 1 2}}
Prerequisite (CO-name for FVT232): A.6.7/2 = "EP"						
A.6.7/4	typeIdentifier	7.1.9	m	m.1: {{1 0 9834 5 2 2}}	m	m.1: {{1 0 9834 5 2 2}}
Prerequisite (CO-name for FVT219): A.6.7/2 = "SM"						
A.6.7/4	typeIdentifier	7.1.9	m	m.1: {{1 3 16 2 7 0 0 2}}	m	m.1: {{1 3 16 2 7 0 0 2}}
A.6.7/7	access	7.1.9	m	m.1: {wavar-and-waca}	m	m.1: {wavar-and-waci}
A.6.7/14	multiElement	7.1.9	m	m.1 SIZE (3)	m	m.1 SIZE (3)
A.6.7/15	ElementParamOffer		m	See table A.15	m	See table A.15
A.6.7/16	elementId		m	m.1: 1..3	m	m.1: 1..3
Prerequisite (CO-name for FVT219): A.6.7/2 = "EC"						
A.6.7/4	typeIdentifier	7.1.9	m	m.1: {{1 3 16 2 7 0 0 3}}	m	m.1: {{1 3 16 2 7 0 0 3}}
A.6.7/7	access	7.1.9	m	m.1: {wavar-and-waca}	m	m.1: {wavar-and-waci}
m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.					

Table A.15 — CSS element offers

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (CO-element-id for FVT219): A.6.7/16 = 1						
A.6.7/17	size	7.1.9	m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 0
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 0	-	
A.6.12/5	maximum		m	x: 0	-	
Prerequisite (CO-element-id for FVT219): A.6.7/16 = 2						
A.6.7/17	size	7.1.9	m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 0
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 0	-	
A.6.12/5	maximum		m	x: 0	-	
Prerequisite (CO-element-id for FVT219): A.6.7/16 = 3						
A.6.7/19	repertoire	7.1.9	m		m	
A.6.4.1/9	repertoire		m	m: {value iso2022: {'2842'H}}	m	m: {value iso2022: {'2842'H}}
m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.					

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Table A.16 — CSS Values

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (CO-name for FVT212): A.6.8/2 = "UA"						
A.6.8/4	typeIdentifier	7.1.8	m	m.1: {1 0 9834 5 0 2}	m	m.1: {1 0 9834 5 0 2}
A.6.8/7	access	7.1.8	m	m.1: waci	m	m.1: waca
Prerequisite (CO-name for FVT222): A.6.8/2 = "EI"						
A.6.8/4	typeIdentifier	7.1.9	m	m.1: {1 0 9834 5 1 2}	m	m.1: {1 0 9834 5 1 2}
Prerequisite (CO-name for FVT232): A.6.8/2 = "EP"						
A.6.8/4	typeIdentifier	7.1.9	m	m.1: {1 0 9834 5 2 2}	m	m.1: {1 0 9834 5 2 2}
Prerequisite (CO-name for FVT219): A.6.8/2 = "SM"						
A.6.8/4	typeIdentifier	7.1.9	m	m.1: {1 3 16 2 7 0 0 2}	m	m.1: {1 3 16 2 7 0 0 2}
A.6.8/7	access	7.1.9	m	m.1: wavar-and-waci	m	m.1: wavar-and-waca
A.6.8/14	multiElement	7.1.9	m	m.1: SIZE (1..3)	m	m.1: SIZE (1..3)
A.6.8/15	ElementParamValue		m	See table A.17	m	See table A.17
A.6.8/16	elementId		m	m.1: 1..3	m	m.1: 1..3
Prerequisite (CO-name for FVT219): A.6.8/2 = "EC"						
A.6.8/4	typeIdentifier	7.1.9	m	m.1: {1 3 16 2 7 0 0 3}	m	m.1: {1 3 16 2 7 0 0 3}
A.6.8/7	access	7.1.9	m	m.1: wavar-and-waci	m	m.1: wavar-and-waca
m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.					

Table A.17 — CSS element values

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (CO-element-id for FVT219): A.6.8/16 = 1)						
A.6.8/17	size	7.1.9	m	m: 0,1	m	m: 0
Prerequisite (CO-element-id for FVT219): A.6.8/16 = 2						
A.6.8/17	size	7.1.9	m	m: 0,1	m	m: 0
Prerequisite (CO-element-id for FVT219): A.6.8/16 = 3						
A.6.8/19	repertoire	7.1.9	m	m: {value iso2022: {'2842'H}}	m	m: {value iso2022: {'2842'H}}
m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.					

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Table A.18 — DEV Offers

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (device name for main device): A.6.10/2 = "D"						
A.6.10/6	deviceRepertoireAssignment	7.1.10	o		x	
A.6.10/7	deviceEmphasisAssignment	7.1.11	m	o.1: SIZE (1..8)	x	
A.6.4.1/20	strings		m	o.1: SIZE (1)	-	
A.6.10/8	deviceForegroundAssignment	7.1.12	m		x	
A.6.10/9	deviceBackgroundAssignment	7.1.12	m		x	
A.6.10/10	minimumXarrayLength	7.1.13	o		o	
A.6.12/1	IntegerOffer		m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 80
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 1	-	
A.6.12/5	maximum		m	x: 1..80	-	
A.6.10/11	minimumYarrayLength	7.1.13	o		o	
A.6.12/1	IntegerOffer		m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 24
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 1	-	
A.6.12/5	maximum		m	x: 1..24	-	
Prerequisite (device name for main device): A.6.10/2 = "P"						
A.6.10/6	deviceRepertoireAssignment	7.1.10	o		x	
A.6.10/7	deviceEmphasisAssignment	7.1.11	m	o.1: SIZE (1..8)	x	
A.6.4.1/20	strings		m	o.1: SIZE (1)	-	
A.6.10/8	deviceForegroundAssignment	7.1.12	m		x	
A.6.10/9	deviceBackgroundAssignment	7.1.12	m		x	
A.6.10/10	minimumXarrayLength	7.1.13	o		o	
A.6.12/1	IntegerOffer		m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 80
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 1	-	
A.6.12/5	maximum		m	x: 1..80	-	
A.6.10/11	minimumYarrayLength	7.1.13	o		o	
A.6.12/1	IntegerOffer		m	m.1: SIZE (1)	m	
A.6.12/2	individualValue		x		m	m: 24
A.6.12/3	range		m		x	
A.6.12/4	minimum		m	m.1: 1	-	
A.6.12/5	maximum		m	x: 1..24	-	

m.1:	t is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.

Table A.19 — DEV Values

Item ref. (9041-2)	Name of item	Normative ref.	TERMINAL SENDING		APPLICATION SENDING	
			Sts	Values	Sts	Values
Prerequisite (device name for main device): A.6.11/2 = "D"						
A.6.11/6	deviceRepertoireAssignment	7.1.10	m		m	m: ALL
A.6.11/7	deviceEmphasisAssignment	7.1.11	m	o.1: SIZE (1..8)	m	m.1: SIZE (1..8)
A.6.11/8	deviceForegroundAssignment	7.1.12	m		m	
A.6.11/9	deviceBackgroundAssignment	7.1.12	m		m	
A.6.11/10	minimumXarrayLength	7.1.13	m	m: 1..80	m	
A.6.11/11	minimumYarrayLength	7.1.13	m	m: 1..24	m	
Prerequisite (device name for main device): A.6.11/2 = "P"						
A.6.11/6	deviceRepertoireAssignment	7.1.10	m		m	m: ALL
A.6.11/7	deviceEmphasisAssignment	7.1.11	m	o.1: SIZE (1..8)	m	m.1: SIZE (1..8)
A.6.11/8	deviceForegroundAssignment	7.1.12	m		m	
A.6.11/9	deviceBackgroundAssignment	7.1.12	m		m	
A.6.11/10	minimumXarrayLength	7.1.13	m	m: 1..80	m	
A.6.11/11	minimumYarrayLength	7.1.13	m	m: 1..24	m	

m.1:	It is mandatory to support all the values of the set, all values not in the set are excluded.
o.1:	It is mandatory to support at least one of the values of the set, all values not in the set are excluded.

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Annex B

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Profile Specific ICS Proforma

B.1 Identification of ICS proforma corrigenda

If corrigenda to this proforma are published, suppliers of the proforma should modify the proforma or attach additional pages, as appropriate, and shall then record the application of the corrigenda by completing table B.1.

Table B.1 — Identification of ICS proforma corrigenda

Identification of corrigenda applied to this ICS proforma	ISO/IEC ISP 11187-4:— Corr: Corr: Corr:

B.2 Instructions

This ICS proforma provides a means for the supplier of an implementation or client of a test laboratory to specify the level of support provided for the semantics of those VT information objects that are referenced by the S-mode Paged Application Profile AVT23.

This information is provided by completing the questionnaire given in section B.6. The questionnaire is in tabular form. Each tabular item describes a capability of an information object. Support for that capability implies that the semantic behaviour of the capability has been implemented in the context of this part of ISO/IEC ISP 11187, in accordance with the specification of the information object concerned.

Each item provides a reference to the semantic specification of the capability, a status value describing the support requirements of the Application Profile and space for a support answer to be given. The references are prefixed by an identifier for the ISP concerned, as follows:

AP — ISO/IEC ISP 11187-4:1995 (Application Profile);

VT — ISO/IEC ISP 11184-1:1995 (VTE-profile);

EI — ISO/IEC ISP 11185-9:1994 (FEICO);

EP — ISO/IEC ISP 11185-11:1994 (FEPCO).

The following notation is used in the status columns:

— m mandatory, the capability is required to be implemented in conformance with the relevant specification;

— o optional, the capability may be implemented, and if it is implemented it is required to conform to the relevant specification;

— c conditional, the requirement depends on the support answer for some other item.

Each conditional status is numbered and references a footnote in the table concerned that gives the corresponding conditional expression. Support answers to other items are referenced in conditional expressions in the form y/z where y is the number of the smallest subclause that contains the item concerned and z is the reference number of the item within that subclause. An optional status may also have a corresponding footnote, for example to specify that two or more options are mutually exclusive.

Support answers shall be given using the following notation:

— 'yes' or 'y' supported;

— 'no' or 'n' not supported.

The following abbreviations are used in the column headings:

— Sts status;

— Spt support.

This notation is in accordance with ISO/IEC 9646-7, to which reference should be made for further information.

Table B.2 — Identification of corrigenda to specifications

Identification of corrigenda implemented for AVT23	ISO/IEC ISP 11187-4:— Corr: Corr:
Identification of corrigenda implemented for FVT122	ISO/IEC ISP 11184-1:— Corr: Corr:
Identification of corrigenda implemented for FVT211, FVT212	ISO/IEC ISP 11185-1:— Corr: Corr:
Identification of corrigenda implemented for FVT213, FVT214	ISO/IEC ISP 11185-2:— Corr: Corr:
Identification of corrigenda implemented for FVT219	ISO/IEC ISP 11185-6:— Corr: Corr:
Identification of corrigenda implemented for FVT2110	ISO/IEC ISP 11185-7:— Corr: Corr:
Identification of corrigenda implemented for FVT222	ISO/IEC ISP 11185-9:— Corr: Corr:
Identification of corrigenda implemented for FVT232	ISO/IEC ISP 11185-11:—

B.3 Identification of the implementation

A supplier or a client of a test laboratory that completes a copy of this ICS proforma shall attach to that copy an identification of the implementation to which it applies, identifying:

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a) the implementation and the system in which it resides;

b) the supplier of the system and/or the client of the test laboratory;

c) the person to contact if there are any queries concerning the content of the ICS.

B.4 Identification of the profile

This ICS proforma applies to the S-mode Paged Application Profile for VT whose specification is given in:

ISO/IEC ISP 11187-4:1995, *Information technology - International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles - Part 4: AVT23 - S-mode Paged Application Profile.*

B.5 Identification of corrigenda to referenced specifications

If corrigenda are published to the specification of the Application Profile, or to the specifications of any of the VT information objects referenced by the Application Profile, table B.2 shall be completed to list the corrigenda that have been implemented. Specifications are listed by their taxonomy identifier in accordance with ISO/IEC TR 10000-2 and corrigenda by the Technical Corrigenda or equivalent that are issued for the ISP containing the specification.

B.6 ICS proforma tables

Table B.3 shall be completed to indicate whether or not the implementation is claimed to conform to this part of ISO/IEC ISP 11187.

Table B.3 — Global statement of conformance

No.	Question	Reply
1	Are all the mandatory capabilities of ISO/IEC ISP 11187-4 implemented?	
NOTE — Answering 'No' to this question indicates non-conformance to the OSI specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming.		

B.6.1 Role

Table B.4 shall be completed to identify whether the configuration is a terminal or an application configuration.

Table B.4 — Role supported

No.	Role	Sts	Reference	Support
1	Terminal	o.1	AP 5.1	
2	Application	o.1	AP 5.1	
o.1:	It is mandatory to support exactly one of these options			

NOTE — A single implementation may be able to act in both a terminal and an application role. Its invocations in these disctinct roles are considered to be different configurations of the implementation. This ICS proforma should be implemented in respect of a particular configuration. See 5.2 of ISO/IEC ISP 11187-1 for further information about the consequences of configurability for the completion of ICS proformas for VT.

B.6.2 Information objects

Table B.5 shall be completed to indicate which VT information objects have been implemented in accordance with the semantics specified in Application Profile AVT23.

Table B.5 — Information objects

No.	Taxonomy identifier	Sts	Reference	Support
1	FVT122	m	AP 5.1	
2	FVT211	m	AP 5.1	
3	FVT212	m	AP 5.1	
4	FVT213	m	AP 5.1	
5	FVT214	m	AP 5.1	
6	FVT219	c1	AP 5.1	
7	FVT2110	c1	AP 5.1	
8	FVT222	m	AP 5.1	
9	FVT232	m	AP 5.1	
c1: IF terminal THEN m ELSE o terminal = B.6.1/1				

B.6.3 Application signals

Table B.6 shall be completed to indicate which values are supported for the Sequenced and Unsequenced Application COs FVT211 and FVT212.

Table B.6 — Application signals

No.	Item name	Sts	Reference	Support
1	audible alarm	m	VT 15.2.2	
2	visual alarm	m	VT 15.2.2	

B.6.4 Terminal signals

B.6.4.1 Modifier flags

Table B.7 shall be completed to indicate, for the Sequenced and Unsequenced Terminal COs FVT213 and FVT214, which modifier flags and flag combinations are supported.

Table B.7 — Terminal signal modifier flags

No.	Item name	Sts	Reference	Support
1	(no flags)	m	VT 15.3	

B.6.4.2 Base type and values

Table B.8 shall be completed to indicate which base values are supported, in each permitted combination with the supported modifier flags, for each of the permitted base types.

NOTE — The only combination that is not permitted is a value of the "character" type in combination with no modifier flags; see 15.3.1 of ISO/IEC ISP 11184-1.

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Table B.8 — Terminal signal base values

No.	Item name	Sts	Reference	Support
1	"character" type	m	VT 15.3	
1.1	0-9	m	VT 15.3	
1.2	A-Z	m	VT 15.3	
2	"function" type	m	VT 15.3	
2.1	F01-F36	m	VT 15.3	

B.6.5 Field Entry Instructions

Table B.9 shall be completed to indicate which FEIs of the FEICO FVT222 are supported.

Table B.9 — Field entry instructions

No.	Item name	Sts	Ref.	Spt
1	Optional field	m	EI 12.4.1	
2	Mandatory field	m	EI 12.4.2	
3	Protected field	m	EI 12.4.3	
4	Inhibit logical rendition attribute operation	m	EI 12.4.4	
5	Echo received character	m	EI 12.4.5	
6	Echo off	m	EI 12.4.6	
7	Fill field	m	EI 12.4.7	
8	Minimum entry	m	EI 12.4.8	
9	Ignore case	m	EI 12.4.9	
10	Allowed first characters	m	EI 12.4.10	
11	Allowed characters	m	EI 12.4.11	
12	Disallowed characters	m	EI 12.4.12	
13	Allowed string values	m	EI 12.4.13	
14	Allowed numeric values	m	EI 12.4.14	

B.6.6 Field Entry Events

Table B.10 shall be completed to indicate which FEEs of the FEPCO FVT232 are supported.

Table B.10 — Field entry events

No.	Item name	Sts	Ref.	Spt
1	Signal event	m	EP 12.4.1	
2	FEI violation	m	EP 12.4.2	

B.6.7 Field Entry Conditions

Table B.11 shall be completed to indicate which FECs of the FEPCO FVT232 are supported.

Table B.11 — Field entry conditions

No.	Item name	Sts	Ref.	Spt
1	Violation	m	EP 12.5.1	
2	Unconditional	m	EP 12.5.2	

B.6.8 Field Entry Reactions

Table B.12 shall be completed to indicate which FERs of the FEPCO FVT232 are supported.

Table B.12 — Field entry reactions

No.	Item name	Sts	Ref.	Spt
1	Transmit updates	m	EP 12.6.1	
2	Relinquish WAVAR	m	EP 12.6.2	
3	Erase field right	m	EP 12.6.3	
4	Erase path right	m	EP 12.6.4	
5	Local action	m	EP 12.6.5	
6	Signal reaction	m	EP 12.6.6	
7	Update integer CO	m	EP 12.6.7	
8	Execute RIO record ref.	m	EP 12.6.8	
9	Execute RIO record content	m	EP 12.6.9	
10	Call RIO record ref.	m	EP 12.6.10	
11	Call RIO record content	m	EP 12.6.11	
12	Visual indication	m	EP 12.6.12	
13	Audible indication	m	EP 12.6.13	
14	Prevent further entry	m	EP 12.6.14	
15	Write disallowed chars.	m	EP 12.6.15	
16	Write string	m	EP 12.6.16	

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Annex C

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Identification of control object classes

C.1 CO classification by sub-register

The procedures specified in ISO/IEC 9834-5 for the form of entries in the International Register of VT Control Object Type Definitions specify that the register shall consist of a number of sub-registers, each of which corresponds to a major classification of VT control object. These procedures further specify that where a register entry is copied with no technical change from one register to a different one then the ASN.1 object identifier originally allocated may be retained to identify the same object in the new register or a new value may be allocated.

The form specified for new object identifier values assigned in the International Register permits the sub-register to be identified without reference to the register entry. Object identifiers retained from an old register may, but need not, permit similar identification of the sub-register. If they do so permit, then such identification requires knowledge of the object identifier structure used by the registration authority concerned.

This annex specifies the forms of ASN.1 object identifier that shall be recognised by a conforming implementation as identifying the sub-register to which a particular VT control object type definition belongs.

C.2 Object identifier forms

It is a recommendation of ISO 9040, given in C.1.1.2 of that International Standard, that object identifiers chosen by a registration authority should have a structure that includes a node which allows identification of the type of control object being registered. In the context of the International Register, this type represents the corresponding sub-register.

This structure requires there to be a node that identifies a VT control object, below which there is an arc that identifies the sub-register. In accordance with ISO 9040, the values to be used for this arc and the corresponding sub-registers are:

— 0 Miscellaneous COs;

— 1 FEICOs;

— 2 FEPCOs;

— 3 RIOs;

— 4 TCCOs.

Registration authorities operating in accordance with ISO/IEC 9834-1 have assigned the following object identifiers as identifying a VT control object:

— { iso(1) standard(0) 9040 controlObject(0) };

— { iso(1) standard(0) 9834 vt-co-def(5) };

— { iso(1) identified-organization(3) ewos(16) eg(2) vt(7) controlObject(0) };

— { iso(1) identified-organization(3) oiw(14) vtsig(12) controlObject(0) };

and have assigned the arc below each of these nodes as identifying a sub-register in accordance with the above recommendation of ISO 9040.

This part of ISO/IEC ISP 11187 requires that when an ASN.1 object identifier with one of the above structures is received as a CO-type-identifier value then it shall be recognised as identifying the sub-register to which the referenced control object type definition belongs.

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Annex D

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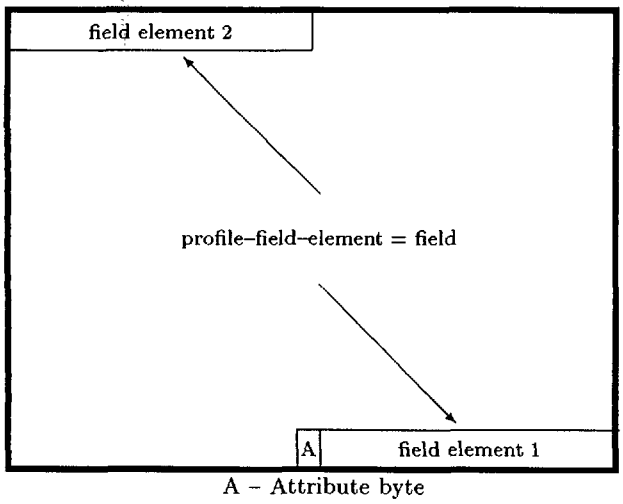
Use of field elements

(Profile–field–element is a set of consecutive array elements, considering *(x-bound, y)* to be followed by *(1, y + 1)* and *(x-bound, y-bound)* to be followed by *(1, 1)*.



A – Attribute byte

Figure 2 — Field element on the end of the screen

Each profile–field–element is built from one or more field elements. Profile–field–element may consist of more than one field element only if each field element immediately follows the previous field element. If a field element extends to the end of the last line of screen, then the following field element (if any) must be on the first line, first column of the screen. This situation is shown in Figure 2. In all other cases a profile–field–element consists of only one field element.

A field element with y–dimension > 1 and x–dimension < *x-bound* (i.e which does not span whole lines) will be split into more than one profile–field–elements (see Figure 3).

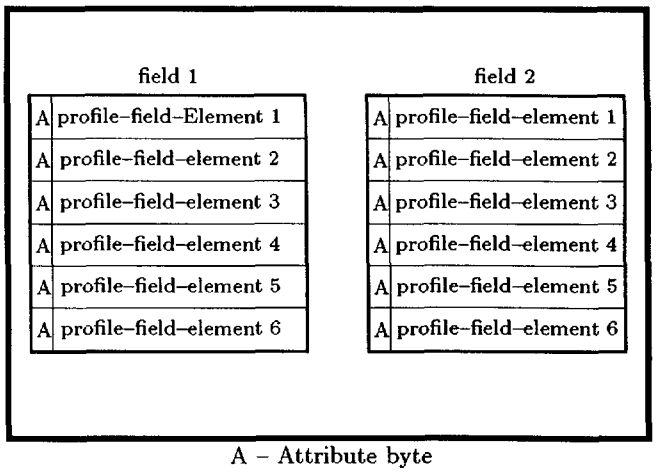
A field element with y–dimension > 1 and the x–dimension equal *x-bound* (i.e a field element which spans whole lines— of course in this case the x–position must be 1) creates one profile–field–element or is a part of one profile–field–element (see the profile–field–element 1 in Figure 4).

If the profile–argument–32 has the value "true" then the fields permitted are those consisting of a sequence of profile–field–elements such that the array element preceding each profile–field–element is outside all fields and is constrained to be empty. Array element *(1, y)* is considered to be preceded with *(x-bound, y - 1)* and *(1, 1)* to be preceded with *(x-bound, y-bound)*. If the profile–argument–32 has the value "false" there is no constraint on the preceding array element.

The reason for this constraint is that some so called block oriented terminals support only one secondary attribute for the whole "field".

The following example shows two fields, each consisting of six profile–field–elements (see Figure 3.).

```
VT-DATA(
   CO-Update "FDCO-x"
   FDCOUpdate
   Field 1
       "active"
       position  x = 16, y = 5
       dimension x = 10, y = 6
       next = 2
       previous = 0
       policy = "all"
       device objects = "DOA"
       feirs
           "FEI", x
       feprs
           "FEP", x
   Field 2
       "active"
       position  x = 50, y = 5
       dimension x = 9, y = 6
       next = 0
       previous = 1
       policy = "all"
       device objects = "DOA"
       feirs
           "FEI", x
       feprs
           "FEP", x
)
```



A – Attribute byte

Figure 3 — Two fields

In a profile–field–element, which consist of more than one field element, the following types of field elements are allowed:

— from *(x, y)* to *(m, y)*; $x > 1$; $x < m \leq$ *x-bound*

— from *(1, y)* to *(x-bound, n)*; $1 < n \leq$ *y-bound*

— from *(1, y)* to *(x, y)*; $1 < x <$ *x-bound*

The first type describes the first line (if it does not start at $x = 1$), the second type describe one or more whole lines (i.e.

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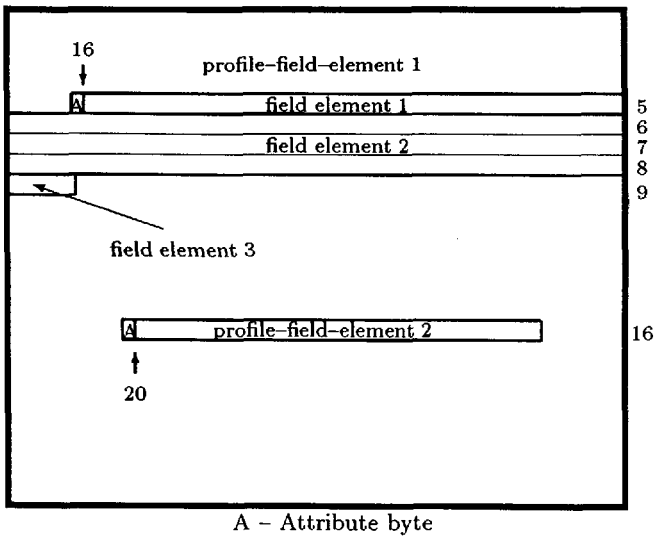
lines from *1* to *x-bound n* times and the third type describes a line which starts at $x = 1$ and ends before *x-bound*.

NOTE — Each profile–field–element may need up to 3 field elements (as defined in 13.1.3 of ISO 9040) to specify it.

All array elements in a profile–field–element shall have the same secondary attributes.

Figure 4 and the following example shows one field and two profile–field-elements.



A – Attribute byte

Figure 4 — One field on a screen

```
VT-DATA(
   CO-Update "FDCO-x"
   FDCOUpdate
   Field 1
       "active"
       position  x = 16, y = 5
       dimension x = 65, y = 1
       position  x = 1,  y = 6
       dimension x = 80, y = 3
       position  x = 1,  y = 9
       dimension x = 10, y = 1
       position  x = 20, y = 16
       dimension x = 46, y = 1
       next = 0
       previous = 0
            .
            .
   )
```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