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Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities —

Part 5:
Register of VT Control Object Definitions

Technologies de l'information — Interconnexion de systèmes ouverts — Procédures pour des organismes d'enregistrement OSI particuliers —

Partie 5: Enregistrement des objets de contrôle VT

Reference number
ISO/IEC 9834-5:1991(E)

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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. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 9834-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 9834 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities*:

— *Part 1: General procedures*

— *Part 2: Registration procedures for OSI document types*

— *Part 3: Registration of object identifier component values for joint ISO-CCITT use*

— *Part 4: Register of VTE Profiles*

— *Part 5: Register of VT Control Object Definitions*

— *Part 6: Registration of AP titles and AE titles*

Annex A forms an integral part of this part of ISO/IEC 9834. Annex B is for information only.

Introduction

The Open Systems Interconnection (OSI) Standards for Basic Class Virtual Terminals (VT), ISO 9040 and ISO 9041–1, have a requirement for

a) unambiguous names for the identification and definition of registered VT Control Objects; and

b) a register of VT Control Object type definitions.

This part of ISO/IEC 9834 specifies the procedures to be followed in preparing and maintaining a register of VTE COs and their names. Such registers can be maintained by any organisation capable of allocating ASN.1 object identifier values. This part of ISO/IEC 9834 also specifies the procedures for preparing and maintaining the International Register.

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Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities –

Part 5 :
Register of VT Control Object Definitions

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1 Scope

This part of ISO/IEC 9834 specifies the contents of register entries recording information about VT control object definitions and assigning unambiguous names of ASN.1 type OBJECT IDENTIFIER to VT CO Definitions. The VT COs specified in this register are defined for use with implementations of VT protocols claiming to conform to ISO 9041-1.

The VTE CO names to which this document refers are for use in fields of the VT communication protocol defined in ISO 9041-1 which need to identify the VT CO definitions defined in the register entries.

A name registered in accordance with this part of ISO/IEC 9834 shall serve as an identification of the VT CO definition associated with it in the register.

The presence of a register entry in the International Register carries no implications of required support for that VT CO definition in any Virtual Terminal implementation.

> NOTE – Nonetheless, within a VT CO definition entry, requirements may be expressed relating to implementations claiming to support the entry.

The requirement for registration for the following CO classification has been identified in ISO 9040:

- Field Entry Instruction COs (FEICOs)
- Field Entry Pilot COs (FEPCOs)
- Reference Information Objects (RIOs)
- Termination Conditions COs (TCCOs)

In addition there is a requirement for the registration of miscellaneous COs. Future VT standards may identify registration requirements for new CO classifications.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 9834. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9834 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards

ISO/IEC 8824 : 1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1).*

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

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

ISO/IEC 9834-1 : 1991, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities – Part 1: General procedures.*

3 Definitions

For the purposes of this part of ISO/IEC 9834, the following terms are used which are defined in ISO 9040.

a) VT-association
b) VTE-parameter
c) service parameter
d) display object
e) control object
f) device object
g) Field
h) Field Definition Control Object
i) Field Definition Record
j) Field Entry Instruction Control Object
k) Field Entry Instruction Record
l) Field Entry Instruction
m) Field Entry Pilot Control Object
n) Field Entry Pilot Record
o) Context Control Object
p) Reference Information Object
q) Termination Condition Control Object
r) Field Entry Event
s) Field Entry Condition
t) Field Entry Reaction

4 Abbreviations

For the purposes of this part of ISO/IEC 9834, the following abbreviations apply.

VT	Virtual Terminal
VTE	Virtual Terminal Environment
ISO	International Organisation for Standardisation
OSI	Open Systems Interconnection
ASN.1	Abstract Syntax Notation One
CO	Control Object
FDCO	Field Definition Control Object
FDR	Field Definition Record
FEICO	Field Entry Instruction Control Object
FEIR	Field Entry Instruction Record
FEI	Field Entry Instruction
FEPCO	Field Entry Pilot Control Object
FEPR	Field Entry Pilot Record
FEE	Field Entry Event
FEC	Field Entry Condition
FER	Field Entry Reaction
CCO	Context Control Object
RIO	Reference Information Object
TCCO	Termination Conditions Control Object

5 Subcommittee

The Responsible subcommittee shall be ISO/IEC JTC1/SC 21.

6 Role of Registration Authority

The Registration Authority performs a technical role in ensuring that entries conform to this part of ISO/IEC 9834 and represent useful and clear specifications.

7 Contents of Register Entries

The contents of Register Entries is specified in annex A.

8 Format of Register Entries

Register Entry proposals shall be in the form specified in annex A.

9 Part 1 applicability

All clauses of ISO/IEC 9834-1 shall apply.

10 Activity

The volume of activity is not expected to exceed 20 registrations per year.

11 Change

Inclusion or modification or deletion of register entries in the International Register shall require the same consensus of ISO Member Bodies, and shall follow similar procedures, to that used for the agreement of an International Standard, except that final approval by ISO/IEC Councils is not required.

12 Availability

Register Entries shall be made available to any requestor by the Registration Authority.

13 Sub-registers

The International Register shall consist a number of sub-registers each of which corresponds to a major classification of VT Control Object. These are

— Miscellaneous COs;
— FEICOs;
— FEPCOs;
— RIOs;
— TCCOs.

New control object types may be defined in future amendments to ISO 9040 or in future VT standards. The registration requirements for these CO types shall be specified in those standards so that this part of ISO/IEC 9834 need not be updated.

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ANNEX A

(normative)

Form of register entries

The headings of this annex are those that shall be used in the register entry. The contents of each clause and sub-clause are defined in the corresponding text below.

NOTE – Examples of register entries appear in annex B, and should be consulted as this annex is now read.

A.1 Entry number

The form of this clause is determined by the authority maintaining the register. It is intended for human use only, and provides unambiguous identification of the register entry within the scope of the authority maintaining the register, but not outside it. Examples are:

- MISCO–03 The third register entry for miscellaneous COs;
- FEICO–05 The fifth register entry for FEICOs;
- FEPCO–11 The eleventh register entry for FEPCOs;
- RIO–06 The sixth register entry for RIOs;
- TCCO–07 The seventh register entry for TCCOs.

A.2 Name of sponsoring authority

This clause shall contain the name of the sponsoring authority (as defined in ISO/IEC 9834-1) which was the proposer of the register entry.

A.3 Date

This clause shall contain the date a proposal was first submitted to the responsible subcommittee, or the date of approval of a register entry.

A.4 Identifier

This clause specifies a value of the ASN1 type OBJECT IDENTIFIER which identifies the VT CO defined by this register entry, and which is used in the CO-type-identifier field of the VT protocol elements which reference this CO.

NOTE – Values of the ASN.1 type OBJECT IDENTIFIER provide globally unambiguous identification of information objects, and are never re-used.

Where an OSI VT CO definition register entry is copied with no technical change from one register to a different one, the object identifier value originally allocated may be retained to identify the same object in the new register or a new value may be allocated. The old object identifier value shall not be re-used to identify a different object.

New object identifiers allocated by the International Registration Authority for VT control object types shall be of the form:

{iso standard 9834 vt-co-def(5) reg(x) y}

where:

a) reg(x) identifies the sub-register and takes the following values:

- reg(x) = 0 – misco(0);
- reg(x) = 1 – feico(1);
- reg(x) = 2 – fepco(2);
- reg(x) = 3 – rio(3);
- reg(x) = 4 – tcco(4).

Values for new sub-registers shall be defined in future VT standards which identify new classifications of CO for registration; and

b) y is the number of the VT control object type in the International Sub-Register.

Object identifiers which are allocated by other registration authorities may be of any form permitted to them under ISO/IEC 8824 but subject to qualification by ISO/IEC 9834-1.

A.5 Descriptor value

This clause specifies a value of ASN.1 ObjectDescriptor which is to be associated with the identifier in clause A.4. Where entries are copied from one register to another, changes to this clause shall be regarded as editorial, not technical.

The ObjectDescriptor value provides human-readable text describing the VT CO Definition covered by the register entry. It should be chosen to provide a high probability of globally unambiguous identification of the VT CO Definition, but this cannot be guaranteed.

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A.6 CO parameters

Table A.1 defines the VTE parameters which specify the CO.

The following notation is used in the table to signify the status of the entrries:

M = Mandatory;
O = Optional;
C = Conditional;
– = CO parameter does not map to a VT Parameter.

Table A.1 - CO Parameters

CO type / CO parameter	Miscellaneous parametric single element CO	Miscellaneous parametric multi–element CO	miscellaneous non–parametric CO	FEICO FEPCO RIO
CO–name	—	—	—	—
CO–type-identifier	—	—	—	—
CO–structure	—	M positive integer	M "non–parametric"	—
CO–access	O (see note 1)	O (see note 1)	O (see note 1)	O (see note 1)
CO–priority	O (see note 1)	O (see note 1)	O (see note 1)	O (see note 1)
CO–trigger	O (see note 1)	O (see note 1)	O (see note 1)	O (see note 1)
CO–element–id	—	M positive integer	—	—
CO–category	O default "boolean" (see note 2)	O default "boolean" (see note 2)	—	—
CO–repertoire	C (see note 3)	C (see note 3)	—	—
CO–size	O (see note 4)	O (see note 4)	—	—

NOTES
1 List any valid values from ISO 9040 – if absent, the normal default applies.
2 The default value of CO–category is "boolean".
3 Present only if category is "character" and if then absent, the normal deafault applies.
4 Value dependent on category and if absent, the normal default applies.

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A.7 CO values, syntax and semantics

This clause specifies the initial data values that the registered CO contains, the semantics associated with those values and for FEICOs and FEPCOs which can be updated, the syntax for the updates.

A.7.1 Miscellaneous COs

A miscellaneous CO may contain a single element or multiple elements as defined in ISO 9040 for parametric COs or may have a non-parametric structure. For each element a single initial value may optionally be given and in the case of category "boolean", multiple values may be given.

A natural language description of the semantics associated with the values contained by this CO is then given. This may for instance, include actions that the VT-user receiving an update to this CO might be expected to perform or deductions made about the update action.

The syntax for updates of COs having a parametric structure is predefined in ISO 9041-1.

A.7.2 FEICOs

A natural language description is given for each Field Entry Instruction (FEI) that is defined in this register entry.

A FEICO is made up of a list of Field Entry Instruction Records (FEIRs). Each FEIR may contain one or more FEIs. The initial content of each FEIR in turn is defined from the set of FEIs described above.

A specification may be given of the cumulative effect of multiple FEIs applied concurrently to data entry to a given field (see ISO 9040 notes to subclause B.18.7)

A statement is made as to whether the FEICO defined by this register entry may be updated. If not, the actual contents of each FEIR are immaterial. The FEI semantics are then associated with the FEICO index that is used in the Field Definition CO (FDCO).

If the FEICO may be updated, then the update syntax for each FEI is given, expressed in ASN.1.

A.7.3 FEPCOs

A natural language description is given for each Field Entry Event (FEE), Field Entry Condition (FEC) and Field Entry Reaction (FER) that is defined in this register entry.

A FEPCO is made up of a list of Field Entry Pilot Records (FEPRs). Each FEPR may contain one FEE, one FEC and one or more FERs. The initial content of each FEPR in turn is defined from the set of FEEs, FECs and FERs described above.

A statement is made as to whether the FEPCO defined by this register entry may be updated. If not, the actual contents of each FEPR are immaterial. The FEPR semantics are then associated with the FEPCO index that is used in the Field Definition CO (FDCO).

If the FEPCO may be updated, then the update syntax for each FEE. FEC and FER is given, expressed in ASN.1.

A.7.4 RIOs

A RIO is made up of a set of RIO records. Each record may contain an arbitrary sequence of DO, CO operations and RIO operations. The content of each record is specified in turn.

NOTE – Where a RIO defines a "form template" it is useful to include a figure showing the layout of the form.

A.7.5 TCCOs

The TCCO is a multi-element CO with the syntax and semantics of the first three elements defined in ISO 9040. For registration

a) the initial values for the first three elements may optionally be defined;

b) the number, category (transparent or character), natural language description of the semantics and optionally initial values for the remaining elements are defined.

A.8 Additional information

Additional notes are included here, as necessary, to state any conditions on the use of the CO, for example its dependence on values of "global" parameters of the VT-association such as VT-mode and on values of specific VTE-parameters.

Requirements may be specified here to be placed on any implementation which claims to support the registered VT CO definition.

This clause is optional and if present is normative.

A.9 Usage

A typical use of the CO is given here for information only. This clause is mandatory.

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ANNEX B

(informative)

Examples of register entries

Example 1 – A multi-element CO for use with an auxiliary printer.

1 Entry number

MISCO–03

2 Name of sponsoring body

The sponsoring body is ISO/IEC JTC1/SC 21/WG 5

3 Date

The date of submission of this proposal is November 17th 1991 .

4 Identifier

{iso standard 9834 vt–co–def(5) misc(0) 3}

5 Descriptor value

"CO for use with auxiliary printer"

6 CO parameters

Main body:

CO–structure 2

Element 1

CO–element–id	1
CO–Category	Boolean
CO–Size	3

Element 2

CO–element–id	2
CO–Category	PrintableString
CO–Repertoire	Default IRV Graphic Set of ISO 646
CO–Size	40

7 CO values and semantics

Element 1

Boolean	Semantics
1	This is the on-off switch and is by convention changed only by the application VT-user. The setting "true" means "on" and "false" means "off". When the boolean is turned from "false" to "true", the printer will start printing the current page of the display object. When, the current page is complete, the terminal VT-user will reset the boolean to "false". If used in S-mode, printing will start when the token is passed to the terminal VT-user and the keyboard and/or other input devices will be disabled whilst printing is taking place. This restriction does not apply to A-mode.
2	This boolean reflects the local state of readiness of the printer. The setting "false" means the printer is "off-line", "true" means the printer is "on-line". This boolean is only set or reset by the terminal end.
3	This boolean reflects the attention status "out of paper". The setting "true" means the printer is out of paper, the setting "false" means the printer is not out of paper. This boolean is only set or reset by the terminal VT-user. The "off-line" boolean is set "false" when this boolean is set "false".

Element 2

The character string contains a terminal operator message and is intended to be used for an operator attention message

8 Additional information

None

9 Usage

This CO is intended to be used when the terminal system has an attached printer. The printer may be started by the application VT-user to print a page. When finished, the terminal VT-user signals completion. The application VT-user may detect the status of the printer whether on-line or off-line and whether out of paper. This CO may be used both in A-mode and in S-mode.

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Example 2 – A typical FEICO

1 Entry number

FEICO–05

2 Name of sponsoring body

The sponsoring body is ISO/IEC JTC1/SC 21/WG 5

3 Date

The date of submission of this proposal is 17th November 1991.

4 Identifier

{iso standard 9834 vt–co–def(5) feico(1) 5}

5 Descriptor value

none

6 CO parameters

CO–Structure "non–parametric"

7 CO Values, syntax and semantics

7.1 Field entry instructions (FEIs)

a) The number of character box entries to be entered into the field. If this number equals zero, the field cannot be modified. Alternatively, this FEI can take the symbolic value "fill" which indicates that the number is taken equal to the size of the field.

b) A list of authorised characters which can be entered into the field. The data entry control program is expected to perform a validity check against this list.

Alternatively, a list of forbidden characters which cannot be entered into the field. The data entry control program is expected to perform a validity check against this list.

This is a complete character repertoire reference as specified in ISO 9040.

c) A list of authorised logical attribute operations which may be performed on the field content. If the list is null, no logical attribute operations are permitted. This list cannot include secondary attribute "character repertoire" which is covered by b above. The list is of attribute type, not extent. It assumed that for a given attribute type, all the extent variations are allowed.

d) The entry invoke graphics character which indicates how to show to the user the character position of the field to be entered, including its display attributes.

e) The display mode for input characters which indicates how an input character is to be echoed - as keyed character, specified fixed character (with display attributes) or no echo at all.

f) The entry waiting time which indicates the time after which lack of action by the terminal user is to cause a reaction.

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7.2 Update syntax

This FEICO may be updated. The skeleton syntax for the update of FEICOs is contained in ISO 9041-1 and goes as far as "FEI ::= ANY. The specific syntax for a FEI is as follows:

```
FEI DEFINITIONS ::= BEGIN

FEI ::= CHOICE
{numEntries                [0]     IMPLICIT INTEGER,
fieldNumEntries            [1]     IMPLICIT NULL,
-- take number of chars from field size
allowedCharacters          [2]     IMPLICIT SEQUENCE
        {                          [1]     IMPLICIT PriValList,
        repertoire                 [2]     IMPLICIT SEQUENCE OF PrintableString OPTIONAL},
        forbiddenCharacters        [3]     IMPLICIT SEQUENCE
                           {               [1]     IMPLICIT PriValList,
                           repertoire      [2]     IMPLICIT SEQUENCE OF PrintableString OPTIONAL},
        allowedAttributes          [4]     IMPLICIT SEQUENCE
                           {foregroundColour       [1]     IMPLICIT NULL OPTIONAL,
                           backgroundColour        [2]     IMPLICIT NULL OPTIONAL,
                           emphasis                [3]     IMPLICIT NULL OPTIONAL,
                           font                    [4]     IMPLICIT NULL OPTIONAL  },
        entryInvoke                [5]     IMPLICIT Character,
        displayMode                CHOICE
                {none              [6]     IMPLICIT NULL,
                echo               [7]     IMPLICIT NULL,
                fixedChar          [8]     IMPLICIT Character},
        waitingTime                [9]     IMPLICIT SEQUENCE
                           {multiplier     INTEGER,
                           exponent        INTEGER}}

Character ::= SEQUENCE
        {primaryValue      [1]     IMPLICIT INTEGER,
        -- constrained by primary value range for repertoire
        attributes         [2]     IMPLICIT SEQUENCE
                {repertoire                [0]     IMPLICIT SEQUENCE OF PrintableString OPTIONAL,
                foregroundColour           [1]     IMPLICIT INTEGER OPTIONAL,
                backgroundColour           [2]     IMPLICIT INTEGER OPTIONAL,
                emphasis                   [3]     IMPLICIT INTEGER OPTIONAL,
                font                       [4]     IMPLICIT INTEGER OPTIONAL   } }

PriValList ::= SET OF CHOICE
        {explVal           [1]     IMPLICIT INTEGER,
        rangeVal           [2]     IMPLICIT SEQUENCE,
                {rangeStart        INTEGER,
                rangeStop          INTEGER} }
                -- values constrained by primary value for repertoire rangeVal includes Start and Stop

END -- OF FEICO DEFINITIONS
```

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7.3 Initial FEICO

FEIR01 Number of characters = 10

FEIR02 Number of characters = size of field

FEIR03 Allowed characters = "ABCD.....XYZ" of the IRV of ISO 646.

FEIR04 Allowed characters = "abcd.....xyz" of the IRV of ISO 646.

FEIR05 Allowed characters = "0123456789" of the IRV of ISO 646.

FEIR06 Allowed attributes = foreground colour,
background colour

FEIR07 Allowed attributes = emphasis

FEIR08 Allowed attributes = font

FEIR09 Entry invoke character =
"-",
white on black,
emphasised,
repertoire - the IRV of ISO 646.

FEIR10 Display mode = invisible

FEIR11 Display mode =
"*",
white on black,
emphasised,
repertoire - of the IRV of ISO 646.

FEIR12 Display mode = echo

FEIR13 Waiting time = 1 minute

FEIR14 Waiting time = 5 minutes

FEIR15 Waiting time = 20 minutes

NOTES

1 FEIR03, 04 and 05 may be called up in combination and the effect is additive.

2 FEIR10 and 11 may not be called up in combination for any given field.

3 FEIR 13, 14 and 15 may not be called up in combination for any given field.

8 Additional Information

None.

9 Usage

This FEICO is intended to be used for simple form based data entry applications. It may be used in conjunction with registered FEPCO-11 and with registered RIO-06.

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Example 3 – A typical FEPCO

1 Entry number

FEPCO–11

2 Name of sponsoring body

The sponsoring body is ISO/IEC JTC1/SC 21/WG 5.

3 Date

The date of submission of this proposal is 17th November 1991 .

4 Identifier

{iso standard 9834 vt–co–def(5) fepco(2) 11}

5 Descriptor value

none

6 CO parameters

CO–Structure "non–parametric"

7 CO values, syntax and semantics

7.1 Field entry events (FEEs)

a) A function key, indicated by the integer m, is operated. (A list of function keys identified by integer values and accompanied by their semantics would be useful.)

b) The end of a field entry is detected. This event is generated when the appropriate number of character box elements have been entered into the field.

c) An erroneous character box is entered. This event is generated when a forbidden character is entered by the terminal user.

d) Correction reverse overflow is detected. This event is generated if the entry cursor is on the first character box element of the field and the correction key (eg backspace key) is depressed.

e) Entry waiting time expiry is detected.

f) Correction following erroneous character is entered. This event is generated if the last entered character was forbidden and the correction key is depressed.

g) Data following erroneous character is entered. This event is generated if the last entered character was forbidden and anew input character (not the correction key) is entered.

7.2 Field entry conditions (FECs)

a) The field is currently at the start of the navigation path.

b) The field is currently at the end of the navigation path.

c) The entry cursor is in the first position to be entered in the field.

d) Condition a) and condition c).

e) Condition b) and condition c).

f) None of the above apply.

g) Not a)

h) Not b)

i) Any

7.3 Field entry reactions (FERs)

a) Deliver all undelivered updates entered up to this point.

b) Execute a designated RIO record.

c) Call a designated RIO record.

d) Ignore the event.

e) Stop further entry, perform a), and in S-mode, relinquish WAVAR. In A-mode, the effect of VT-start-entry service parameter is cancelled.

f) Erase all data entered into the current field and restart the field.

g) Erase all data entered and restart at k=1 in the initial field as indicated in CCO.

h) Change the local cursor to address k=1 in the "next" field, if any, on the forward navigation path.

i) Change the logical pointer to address k=1 in the "previous" field, if any, on the backward navigation path.

j) Display error message, erase character, reposition entry cursor.

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7.4 Update Syntax

This FEPCO may be updated. The skeleton syntax for the update of FEPCOs is contained in ISO 9041-1 and goes as far as "FEE ::= ANY, FEC ::= ANY and FER ::= ANY. The specific syntax for FEEs, FECs and FERs is as follows:

```
FEPR DEFINITIONS ::= BEGIN

FEE ::= CHOICE
        {functionkey    [0]     IMPLICIT INTEGER,
        endOfField      [1]     IMPLICIT NULL,
        badChar         [2]     IMPLICIT NULL,
        reverseOFlow    [3]     IMPLICIT NULL,
        timeExpired     [4]     IMPLICIT NULL,
        corrAfterBad    [5]     IMPLICIT NULL,
        goodAfterBad    [6]     IMPLICIT NULL  }

FEC ::= CHOICE
        {none           [0]     IMPLICIT NULL,
        first           [1]     IMPLICIT NULL,
        last            [2]     IMPLICIT NULL,
        firstChar       [3]     IMPLICIT NULL,
        firstFirst      [4]     IMPLICIT NULL,
        lastFirst       [5]     IMPLICIT NULL,
        notFirst        [6]     IMPLICIT NULL,
        notLast         [7]     IMPLICIT NULL,
        any             [8]     IMPLICIT NULL  }

FER ::= CHOICE
        {ignore         [0]     IMPLICIT NULL,
        deliver         [1]     IMPLICIT NULL,
        execute         [2]     IMPLICIT RIORecordId,
        call            [3]     IMPLICIT RIORecordId,
        deliverToken    [4]     IMPLICIT NULL,
        eraseFieldStrt  [5]     IMPLICIT NULL,
        eraseAllStrt    [6]     IMPLICIT NULL,
        nextField       [7]     IMPLICIT NULL,
        previousField   [8]     IMPLICIT NULL,
        eraseCharStrt   [9]     IMPLICIT NULL  }

RIORecordId ::= SEQUENCE
        {rioName    [1] IMPLICIT PrintableString OPTIONAL,
        -- OPTIONAL if there is only one RIO in the VTE
        recordId    [2] IMPLICIT PrintableString}

END -- OF FEPR DEFINITIONS
```

7.5 Initial FEPCO

FEPR01

Event	Function Key "m" - next field
Condition	Field not at end
Reaction	Position to next field

FEPR02

Event	Function Key "m" - next field
Condition	Field at end
Reaction	Display error message

FEPR03

Event	Function Key "m" - previous field
Condition	Field not at start
Reaction	Position to previous field

FEPR04

Event	Function Key "m" - previous field
Condition	Field at start
Reaction	Error message

FEPR05

Event	Function Key "m" - abort field
Condition	Any
Reaction	Erase data and restart field

FEPR06

Event	Function Key "m" - restart
Condition	Any
Reaction	Erase all data entered and restart at beginning

FEPR07

Event	End of field
Condition	Field not at end
Reaction	Position to next field

FEPR08

Event	End of field
Condition	Field at end
Reaction	Deliver all undelivered updates, Relinquish Wavar

FEPR09

Event	Bad character
Condition	Any
Reaction	Display error message, erase bad character, reposition entry cursor

etc, etc

8 Additional information

None.

9 Usage

This FEPCO is intended to be used for simple form based data entry applications. It may be used in conjunction with registered FEICO–05 and with registered RIO–06.

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Example 4 – a typical RIO

1 Entry number

RIO–06

2 Name of sponsoring body

The sponsoring body is ISO/IEC JTC1/SC 21/WG 5.

3 Date

The date of submission of this proposal is 17th Novemeber 1991.

4 Identifier

{iso standard 9834 vt–co–def(5) rio(3) 6}

5 Descriptor value

none

6 CO parameters

CO–Structure "structured"

7 CO values and semantics

The template for the form shown in figure B.1 is set up in the RIO as follows:

a) The image of the empty form as a VT-DATA display object update.

b) The field definition as a VT-DATA CO update to the FDCO. It is assumed that the VTE contains the registered FEICO-05 and FEPCO-11.

c) The CCO update to indicate start field for entry.

d) Finally a VT-GIVE-TOKEN to start data entry.

NOTE – There is no need for FEICO or FEPCO updates.

7.1 RIO record "form"

```
VT-DATA(
  Display Object Update,
  Erase-y-array    All          -clear screen
  WriteAttr        foregroundColour = White Global
                   backgroundColour = Black Global
  Ptr-absolute     x=1, y=1
  Text              "---...---" -- 69 of them
  Next-x-array
  Text             "|<67 spaces>|"
  Next-x-array
  Text             "|<19 spaces>NEW EMPLOYEE DATA
  INPUT FORM<19 SPACES|"
  ETC TO END OF FORM
  )
```

7.2 RIO record "fields"

```
VT-DATA(
  CO-Update
  "FDCO–1"
  FDCOUpdate

    Field 1
        "active"
        position  x = 21, y = 7
        dimension  x = 20, y = 1
        next = 2
        previous = 0    -- ie start field
        policy = "all"
        device objects = "DOA"
        feirs
                "FEI", 2   -- no of chars = size of field
                "FEI", 3   -- upper case alpha
                "FEI", 4   -- lower case alpha
                "FEI", 9   -- entry invoke char emphasised
                           -- white on black
                "FEI", 12  -- display mode "echo"
                "FEI", 14  -- wait time 5 minutes
        feprs
                "FEP", 1  -- Function key - skip to next field
                "FEP", 3  -- Function key - skip to previous
                          -- error
                "FEP", 5  -- Function key - abort field/restart
                "FEP", 6  -- Function key - restart form
                "FEP", 7  -- End of field - go to next
                "FEP", 9  -- Bad character, error message,
                          -- restart char

        etc, etc

    Field 2

        etc, etc to Field 13          )
```

7.3 RIO record "start"

```
VT-DATA(
  CO Update
  "CCO"
  CCOUpdate
    k = 1
    f = 1
  )

VT-GIVE-TOKENS
```

8 Additional information

This registered RIO is designed to work with the registered FEICO-05 and the registered FEPCO-11

9 Usage

This RIO has been designed to be used with the J.Bloggs Ltd Personnel System product "People".

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