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AMENDMENT 2
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Information technology — Font information interchange —

Part 1:
Architecture

AMENDMENT 2: Minor enhancements to the architecture to address font technology advances

Technologies de l'information — Échange d'informations sur les fontes —

Partie 1: Architecture

AMENDEMENT 2: Améliorations mineures de l'architecture pour traiter les avances technologiques des fontes

Reference number
ISO/IEC 9541-1:1991/Amd.2:1998(E)

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.

Amendment 2 to ISO/IEC 9541-1:1991 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

Introduction

This minor enhancement specifies additional properties of the Font Resource defined by ISO/IEC 9541-1:1991. The properties make it possible to address advances in font technology and in the increasing complexity of document processing. The properties of this Amendment are optional and in addition to those defined in ISO/IEC 9541-1:1991, with the interchange format being defined in Amendment 1 to ISO/IEC 9541-2:1991.

Information technology — Font information interchange —

Part 1: Architecture

Amendment 2: Minor enhancements to the architecture to address font technology advances

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Clause 3

Add the following definitions:

3.28 body size: The font size, measured along the y axis of the glyph coodinate system.

3.29 extended body size: A reference size with two components, measured respectively along the x and y axes of the glyph coordinate system.

3.30 design frame: Dimensional expression that specifies the area inside which a set of glyph images can be designed.

3.31 bounding box: Dimensional expression to specify an actual area that a glyph image occupies within a design frame.

3.32 blackness: The ratio of the blackened area of a glyph image to the extended body size area of the glyph image.

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Clause 8

Add the following properties:

8.9 Properties

8.9.1 Vertical Units and Horizontal Units (VUNITS, HUNITS)

VUNITS and HUNITS are cardinals, the number of relative units equal to the extended body size of the font resource, as measured along the y axis and x axis respectively of the glyph coordinate system.

```
verticalunit-property ::= verticalunit-name, verticalunit-value
verticalunit-name ::= STRUCTURED-NAME
                      -- ISO/IEC 9541-1//VUNITS
```

```
verticalunit-value ::= CARDINAL
horizontalunit-property ::= horizontalunit-name,
                            horizontalunit-value
horizontalunit-name ::= STRUCTURED-NAME
                    -- ISO/IEC 9541-1//HUNITS
horizontalunit-value ::= CARDINAL
```

NOTE 1 The property RELUNITS specifies body size as measured only along the y axis of the glyph coordinate system. However, in some fonts, e.g., a certain Kanji font, dimensional references of their extended body size have to be defined in both x axis and y axis.

NOTE 2 The typical value of VUNITS should be 1000, so as to harmonize with that of RELUNITS.

8.9.2 Fill Ratio (FILLRATIO)

FILLRATIO is a property-list, specifying a blackness of a glyph image of a reference glyph in the font resource.

```
fillratio-property ::= fillratio-name,
                       fillratio-value-property-list
fillratio-name ::=STRUCTURED-NAME
               -- ISO/IEC 9541-1//FILLRATIO
fillratio-value-property-list ::= (blackness)+
blackness ::= reference-glyph, fillratio-value
reference-glyph ::= MESSAGE
               -- specification of a typical glyph
fillratio-value ::= RATIONAL
               -- (blackened area)x1000 /(VUNITS x HUNITS)
```

NOTE 3 Fill Ratio is used to determine an appropriate font substitution.

NOTE 4 In Latin fonts, "I" or "i" is used as a reference glyph. In Japanese fonts, reference glyphs may be "米" or "〇".

8.9.3 Design Areas (DSNAREAS)

DSNAREAS is a property-list consisting of the property-lists that specify the design frames within which sets of glyph images are designed in their extended body sizes.

```
designareas-property ::= designareas-name,
                         designareas-value-property-list
designareas-name ::=STRUCTURED-NAME
                 -- ISO/IEC 9541-1//DSNAREAS
designareas-value-property-list ::= (designarea-property |
                                     property-list)+
```

8.9.3.1 Design Area (DSNAREA)

DSNAREA is a property-list specifying the design frame as measured by rel-rationals along the y axis and x axis in each set of glyphs. The set of glyphs configures a subset of the glyph collection of the font resource.

```
designarea-property ::= designarea-name,
                        designarea-value-property-list
designarea-name ::=STRUCTURED-NAME
                -- ISO/IEC 9541-1//DSNAREA
designarea-value-property-list ::= (letter-face)+
letter-face ::= dsnarea-glyphset-name, dsnarea-height, dsnarea-width
dsnarea-glyphset-name ::= MESSAGE
            -- specification of glyph-set name
dsnarea-height ::= REL-RATIONAL
            -- y value of the design frame
dsnarea-width ::= REL-RATIONAL
            -- x value of the design frame
```

NOTE 5 A glyph-set need not be a registered glyph collection.

NOTE 6 The property DSNAREA shows an extent of glyph alignment compactness in a composed line or line progression.

8.9.4 Average ESC (AVRESC)

AVRESC is a property-list consisting of the property-lists that specify the average sizes of bounding boxes which the designed glyph shapes actually cover in their design area.

```
averageesc-property ::= averageesc-name,
                        averageesc-value-property-list
averageesc-name ::=STRUCTURED-NAME
                -- ISO/IEC 9541-1//AVRESC
averageesc-value-property-list ::= (averagelen-property |
                                    property-list)+
```

8.9.4.1 Average LEN (AVRLEN)

AVRLEN is a property-list specifying the average sizes of bounding box as measured by rel-rationals along the y axis and x axis in each set of glyphs, e.g., a katakana glyph set. The set of glyphs configures a subset of the glyph collection of the font resource.

```
averagelen-property ::= averagelen-name,
                        averagelen-value-property-list
averagelen-name ::=STRUCTURED-NAME
                -- ISO/IEC 9541-1//AVRLEN
averagelen-value-property-list ::= (average-length)+
average-length ::= avrlen-glyphset-name, avrlen-height, avrlen-width
avrlen-glyphset-name ::= MESSAGE
             -- specification of glyph-set name
avrlen-height ::= REL-RATIONAL
             -- y value of the bounding box
avrlen-width ::= REL-RATIONAL
             -- x value of the bounding box
```

NOTE 7 A glyph-set need not be a registered glyph collection. An average escapement of a glyph collection can be specified by the property AVGESCY or AVGESCX. The property AVRLEN can specify an average escapement of a part of the glyph collection.

NOTE 8 The property AVRLEN shows a limit of glyph alignment compactness in a composed line or line progression. The simpler functions can be provided by a-z length in Latin fonts.

NOTE 9 A relationship between VUNITS, HUNITS, DSNAREA and AVRLEN is shown in figure 7.

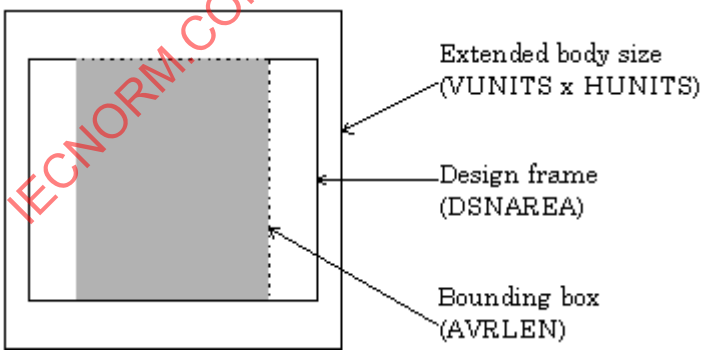

Figure 7 The relationship between VUNITS, HUNITS, DSNAREA and AVRLEN.

NOTE 10 The figure 7 illustrates only the relative positions of extended body size, design frame and bounding box.

8.9.5 Generalized Kendot (GENKENDOT)

In a simple formatting, kendots are supported by using the font property SCORE with specifying KENDOT score object. However, the property SCORE can only describe a simple dot with its specified offset and thickness.

More complicated formatting may require a particular shape for kendot. Generalized Kendot includes the capability to specify dot shape.

```
genkendot-property ::= genkendot-name, genkendot-value-property-list
genkendot-name ::= STRUCTURED-NAME
                    -- ISO/IEC 9541-1//GENKENDOT
genkendot-value-property-list ::=
                   (genkendot-offsetx-property |
                    genkendot-offsety-property |
                    genkendot-thick-property |
                    genkendot-shape-property)+
genkendot-offsetx-property ::= genkendot-offsetx-name,
                               genkendot-offsetx-value
genkendot-offsetx-name ::= STRUCTURED-NAME
                           -- ISO/IEC 9541-1//GENKENDOTOFFSETX
genkendot-offsetx-value ::= REL-RATIONAL
genkendot-offsety-property ::= genkendot-offsety-name,
                               genkendot-offsety-value
genkendot-offsety-name ::= STRUCTURED-NAME
                           -- ISO/IEC 9541-1//GENKENDOTOFFSETY
genkendot-offsety-value ::= REL-RATIONAL
genkendot-thick-property ::= genkendot-thick-name,
                             genkendot-thick-value
genkendot-thick-name ::= STRUCTURED-NAME
                           -- ISO/IEC 9541-1//GENKENDOTTHICK
genkendot-thick-value ::= REL-RATIONAL
genekendot-shape-property ::= genkendot-shape-name,
                              genkendot-shape-value
genkendot-shape-name ::= STRUCTURED-NAME
                           -- ISO/IEC 9541-1//GENKENDOTSHAPE
genkendot-shape-value ::= STRUCTURED-NAME
                           -- Dot Glyph Name
```