WG2 N4914
L2/17-294

Universal Multiple-Octet Coded Character Set
International Organization for Standardization

Doc Type: Working Group Document
Title: Proposal to add standardized variation sequence for U+FF10 FULLWIDTH DIGIT ZERO
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Status: Corporate Full Member Contribution
Action: For consideration by the UTC
Date: 2017-08-14
References: L2/15-268

Background

Discussions of document L2/15-268 resulted in a small number of standardized variation sequences to be added in Unicode Version 9.0, including the following one that is directly relevant to this particular proposal:

```
0030 FE00; short diagonal stroke form; # DIGIT ZERO
```

The Adobe-Japan1-6 glyph set, which is used as the basis for hundreds, and possibly thousands, of OpenType Japanese fonts, includes several “slashed zero” glyphs, three of which correspond to <U+0030,U+FE00>. The glyphs are CIDs 230 (proportional upright), 632 (half-width), and 9673 (proportional italic), all of which are unified with U+0030 DIGIT ZERO.* Also included in this glyph set is a full-width version at CID+8228 that is a variant of the glyph that maps from U+FF10 FULLWIDTH DIGIT ZERO. The table below shows the corresponding “slashed zero” glyphs from the *Kozuka*, *Meiryo*, *Hiragino*, and *Heisei* typeface families:

Typeface Family	Proportional		Proportional Italic		Half-Width		Full-Width	
Kozuka Mincho	0	Ø	*0*	*Ø*	0	Ø	0	Ø
Kozuka Gothic	0	Ø	*0*	*Ø*	0	Ø	0	Ø
Meiryo	0	Ø	*0*	*Ø*	0	Ø	0	Ø
Hiragino Mincho	0	Ø	*0*	*Ø*	0	Ø	0	Ø
Hiragino Kaku Gothic	0	Ø	*0*	*Ø*	0	Ø	0	Ø
Heisei Mincho	0	Ø	n/a		0	Ø	0	Ø
Heisei Kaku Gothic	**0**	**Ø**	n/a		**0**	**Ø**	0	**Ø**

* Also included in this glyph set are pre-rotated versions of these three glyphs at CIDs 8949 (CID+230), 9081 (CID+632), and 13189 (CID+9673) that are referenced by the effectively-deprecated OpenType 'vrt2' GSUB feature.

Proposal Summary

This document proposes to add the following single standardized variation sequence whose description follows that of the one that uses U+0030 DIGIT ZERO as its base character::

```
FF10 FE00; short diagonal stroke form; # FULLWIDTH DIGIT ZERO
```

Rationale, History & Conclusion

Virtually all Japanese fonts include the glyph that corresponds to the full-width slashed zero, and all of the forms that are shown in the table of the first page of this document were accessed via the OpenType 'zero' GSUB feature.

Full-width digits and Latin characters are often used in Japanese text, and any such string that includes a mixture of such characters has the potential to require the digit zero to be visually distinct from U+FF2F FULLWIDTH LATIN CAPITAL LETTER O, whose glyph may exhibit a similar or identical shape, depending on the typeface design. This is similar to the use cases that benefit from the existing <U+0030,U+FE00> standardized variation sequence.

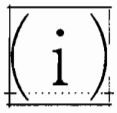
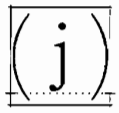
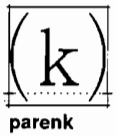
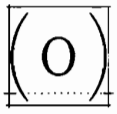
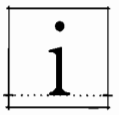
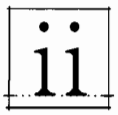
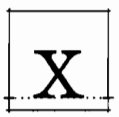
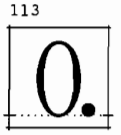
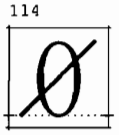
Compatibility decomposition for U+FF10, which can affect the full-width characters in the Halfwidth and Fullwidth Forms block, is no worse than other full-width characters in the same block, and will still render as a “slashed zero” form of U+0030 as a result of the existing <U+0030,U+FE00> standardized variation sequence, as long as both UVSes (*Unicode Variation Sequences*)—<U+0030,U+FE00> and <U+FF10,U+FE00>—are specified in the selected font’s Format 14 'cmap' subtable and resolve to a “slashed zero” glyph.

In terms of history, the inclusion of the full-width “slashed zero” glyph in Adobe’s Japanese glyph set extends back to the late 1980s, before I joined Adobe in mid-1991, and is due to Morisawa, Japan’s leading type foundry, including this particular glyph in their very first two PostScript Japanese fonts, *Ryumin-Light* and *GothicBBB-Medium*, and in all subsequent fonts.

This glyph was first documented in Adobe Technical Note #5031, *Kanji Glyph Collections And Glyph Sets*, which is dated 1990-11-12, and is shown on page 165 as the glyph named *zeroslash* in Collection 8, *Full-width and Half-width Face-specific Symbols* (see the following page for a scan of the entire page). In terms of composite font organization, this glyph was included in the *AlphaNum* row font of the *Symbol* PG group. When the Adobe-Japan1-0 glyph set was defined in the early 1990s, this glyph was included as CID+8228.

Accepting this new standardized variation sequence will help to bring parity to the full-width “slashed zero” glyph that is present in virtually all Japanese fonts, which also include glyphs that correspond to the existing <U+0030,U+FE00> standardized variation sequence.

That is all.

64 parend	65 parene	66 parenf	67 pareng	68 parenh	69  pareni	70  parenj
71  parenk	72 parenl	73 parenm	74 parenn	75  pareno	76 parenp	77 parenq
78 parenr	79 parens	80 parent	81 parenu	82 parenv	83 parenw	84 parenx
85 pareny	86 parenz	87 romanI	88 romanII	89 romanIII	90 romanIV	91 romanIX
92 romanV	93 romanVI	94 romanVII	95 romanVIII	96 romanX	97 romanXI	98 romanXII
99  romani	100  romanii	101 romaniii	102 romaniv	103 romanix	104 romanv	105 romanvi
106 romanvii	107 romanviii	108  romanx	109 sevendot	110 sixdot	111 threedot	112 twodot
113  zerodot	114  zeroslash					