Technical Reports

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UNICODE VERTICAL TEXT LAYOUT

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Summary

The Unicode code charts generally show characters oriented for horizontal presentation. However, some of the glyphs are actually oriented for vertical presentation. A few characters change shape or orientation when the text is rotated from horizontal to vertical.

When text is presented, there are various conventions for the orientation of the characters with respect to the line. In most cases, characters are oriented in an upright manner similar to their presentation in the Unicode code charts. In a few cases, when presented in vertical lines, the characters will appear rotated or transformed in various ways. For example, in East Asia, Han ideographs, Kana syllables, Hangul syllables, and Latin letters in acronyms are upright, while words and sentences in the Latin script are typically sideways. This report describes a Unicode character property which can serve as a stable default orientation of characters for reliable document interchange.

Status

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> ***A Unicode Standard Annex (UAX)** forms an integral part of the Unicode Standard, but is published online as a separate document. The Unicode Standard may require conformance to normative content in a Unicode Standard Annex, if so specified in the Conformance chapter of that version of the Unicode Standard. The version number of a UAX document corresponds to the version of the Unicode Standard of which it forms a part.*

Please submit corrigenda and other comments with the online reporting form [Feedback]. Related information that is useful in understanding this annex is found in Unicode Standard Annex #41, "Common References for Unicode Standard Annexes." For the latest version of the Unicode Standard, see [Unicode]. For a list of current Unicode Technical Reports, see [Reports]. For more information about versions of the Unicode Standard, see [Versions]. For any errata which may apply to this annex, see [Errata].

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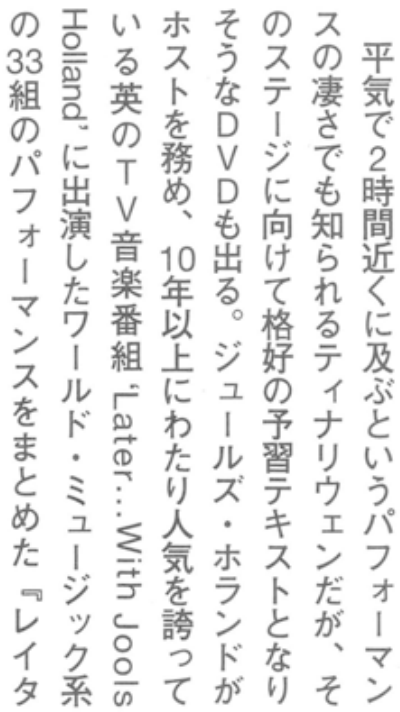
1 Overview and Scope

When text is displayed in vertical lines, there are various conventions for the orientation of the characters with respect to the line. In East Asia, Han ideographs, Kana syllables, and Hangul syllables, along with Latin letters of acronyms, remain upright, meaning that they appear with the same orientation as in the code charts, but words and sentences that are composed of characters of the Latin script are typically oriented sideways, as can be seen in Figure 1.

Figure 1. Japanese Vertical Text



In many parts of the world, most characters are upright, as can be seen in Figure 2.

Figure 2. Western Vertical Text

Most languages and scripts are written horizontally and vertical presentation is a special case, usually used for short runs of text (as in Figure 2). Some languages, however, have publishing traditions that provide for long-format vertical text presentation, notably East Asian languages such as Japanese. In those languages, the orientation in which characters are laid out can vary, depending on the scripts, the style, and sometimes the context. The preferred or desired orientation may also change over time.

While the choice of orientation for a character can vary across documents, it is important that the choice made by an author for a specific document be clearly established, so that a rendering system can display what the author intended. It is also important that this choice be established independently of the font resources, as the rendering systems may have to use other fonts than those intended or specified in the document. Finally, the expression of the author's choice should be relatively concise, to facilitate document authoring and minimize document size.

This report describes a Unicode character property which can serve as a stable default character orientation for the purpose of reliable document interchange.

For the purpose of reliable document interchange, this property defines an unambiguous default value, so that implementations could reliably render a character stream based solely on the property values, without depending on other information such as provided in the tables of the selected font.

The intent is that document formats should offer to the author the possibility of specifying the desired orientation of a given character (either all occurrences or a particular occurrence), and that in the absence of an explicit specification, the orientation is implicitly that defined by the property presented in this report.

In plain text, which by definition does not allow the recording of any data beyond the characters, the orientations are by necessity those specified by the property.

The actual choice for the property values should result in a reasonable or legible default, but it may not be publishing-material quality, and it may not be a good choice if used in a specific style or context.

The property values are chosen first to match existing practice in Japanese context in Japan and then in other East Asian contexts in their respective environments. For characters that are not generally used in such environments, similarity to existing characters has been taken into consideration. Commonly used characters of Latin and other scripts that appear in Japanese and other East Asian environments are also taken into account, but with the lower priority.

2 Conformance

The property defined in this report is informative. The intent of this report is to provide, in the absence of other information, a reasonable way to determine the correct orientation of characters, but this behavior can be overridden by a higher-level protocol, such as through markup or by the preferences of a layout application. This default determination is defined in the data file [Data50] in the Unicode Character Database [UCD], but in no way implies that the character is used only in that orientation.

For more information on the conformance implications, see [Unicode], Section 3.5, Properties, in particular the definition (D35) of an informative property.

3 The Vertical_Orientation Property (vo)

3.1 Property Values

The possible Vertical_Orientation property values are given in Table 1.

Table 1. Property Values

U	Characters which are displayed upright, with the same orientation that appears in the code charts.
R	Characters which are displayed sideways, rotated 90 degrees clockwise compared to the code charts.
Tu	Characters which are not just upright or sideways, but generally require a different glyph than in the code charts when used in vertical texts. In addition, as a fallback, the character can be displayed with the code chart glyph upright.
Tr	Same as Tu except that, as a fallback, the character can be displayed with the code chart glyph rotated 90 degrees clockwise.

Note that the orientation is described with respect to the appearance in the code charts.

3.2 Scope of the Property

3.2.1 Grapheme Clusters

As in all matters of typography, the interesting unit of text is not the character, but a grapheme cluster: it does not make sense to use a base character upright and a combining mark attached to it sideways. Implementations should apply the orientation to each grapheme cluster.

A possible choice for the notion of grapheme cluster is either that of legacy grapheme cluster or that of extended grapheme cluster, as defined in [UAX29].

The orientation for a grapheme cluster as a whole is then determined by taking the orientation of the first character in the cluster, with the following exception:

> If the cluster contains an enclosing combining mark (general category Me), then the whole cluster has the Vertical_Orientation property value U.

3.2.2 Squared Katakana and Ideographic Words

There are special typographic conventions to consider, for Japanese text layout in particular. It is common practice to represent particular katakana words and ideographic sequences as a single precomposed glyph whose components are arranged within the confines of the em-box, and are therefore the same size as a conventional ideograph. Such characters are referred to as a *squared word*. Furthermore, the arrangement of the components in the em-box differs depending on whether the layout is horizontal or vertical.

There are a significant number of such compatibility characters encoded in the Unicode Standard that were inherited from legacy Japanese character encoding standards. As a result of the required layout rules, these characters must be supported in East Asian fonts using separate glyphs for horizontal and vertical layout. Accordingly, one of the primary motivations for the Vertical_Orientation property value Tu is to identify the compatibility characters that exhibit such behavior.

The same layout rules apply in cases where a katakana word or ideographic sequence is displayed as a squared word, but no single, encoded compatibility character exists for that sequence in the Unicode Standard. For example, 有限会社 (*yūgen gaisha* “limited liability company”) and 財団法人 (*zaidan hōjin* “foundation”) are commonly displayed the same way in text as U+337F ㍾ SQUARE CORPORATION whose horizontal and vertical glyphs are shown in Table 3.

The individual katakana characters or CJK unified ideographs that comprise these squared words are assigned the Vertical_Orientation property value U, Tu, or Tr, and therefore remain upright in vertical layout or have their own vertical form. For example, U+3312 ㌔ SQUARE KYURII, whose horizontal and vertical glyphs are shown in Table 3, is composed of U+30AD キ KATAKANA LETTER KI, U+30E5 ュ KATAKANA LETTER SMALL YU, U+30EA リ KATAKANA LETTER RI, and U+30FC ー KATAKANA-HIRAGANA PROLONGED SOUND MARK. U+30AD and U+30EA are assigned the Vertical_Orientation property value U, U+30E5 is assigned Tu, and U+30FC is assigned Tr.

3.2.3 Right-to-Left Scripts

This property has a current limitation in that the handling of right-to-left scripts is not specified. This includes scripts that are predominantly written right to left, such as Arabic, along with right-to-left scripts that are meant to be written vertically, such as Chorasmian.

3.2.4 Quotation Marks

When certain quotation marks are displayed using fullwidth glyphs, a different glyph is normally used in vertical layout. This is the case whether the implementation always uses a fullwidth glyph or does so in response to a Standardized Variation Sequence. It is ultimately up to the selected font’s tables, such as the presence of substitutions in the 'vert' (*Vertical Alternates*) layout feature, and the layout software to determine whether their glyphs should be simply rotated or substituted with a different glyph. The affected characters are the four quotation marks: U+2018 ‘ LEFT SINGLE QUOTATION MARK, U+2019 ’ RIGHT SINGLE QUOTATION MARK, U+201C “ LEFT DOUBLE QUOTATION MARK, and U+201D ” RIGHT DOUBLE QUOTATION MARK. The behavior of their fullwidth glyphs in vertical layout is shown in Table 2.

Table 2. Fullwidth Quotation Mark Glyph Changes for Vertical Orientation

Character & Standardized Variation Sequence	Horizontal	Vertical	Vertical—Hans
U+2018 LEFT SINGLE QUOTATION MARK <2018, FE01>	‘	︑	﹁
U+2019 RIGHT SINGLE QUOTATION MARK <2019, FE01>	’	︒	﹂
U+201C LEFT DOUBLE QUOTATION MARK <201C, FE01>	“	︓	﹃
U+201D RIGHT DOUBLE QUOTATION MARK <201D, FE01>	”	︔	﹄

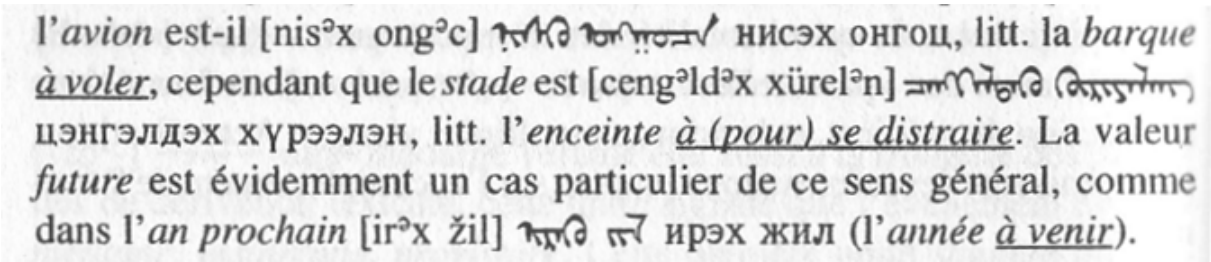
Note that the vertical forms of U+201C and U+201D are the same as the vertical forms of U+301D 〝 REVERSED DOUBLE PRIME QUOTATION MARK and U+301F 〟 LOW DOUBLE PRIME QUOTATION MARK, respectively, as shown in Table 3, and that there are no horizontal equivalents of the vertical forms of U+2018 and U+2019. In addition, according to conventions in China, as shown in

the **Vertical—Hans** column of Table 2, the vertical forms of all four quotation marks are the same as the vertical forms of U+300C 「LEFT CORNER BRACKET, U+300D 」 RIGHT CORNER BRACKET, U+300E 『LEFT WHITE CORNER BRACKET, and U+300F 』 RIGHT WHITE CORNER BRACKET, respectively, which are also shown in Table 3.

3.3 Vertical Glyphs in the Code Charts

The Unicode code charts generally show characters in the orientation they take when used in horizontal lines. However, prior to Unicode 7.0, there were a few exceptions, mostly for characters or scripts which are normally written in vertical lines; in those cases, the code charts used to show the characters in the same orientation as in vertical lines. Furthermore, such characters are often rotated when displayed in horizontal lines; Figure 3 shows an example of Mongolian text in horizontal lines in which the Mongolian characters are rotated 90 degrees counterclockwise with respect to the code charts prior to Unicode 7.0.

Figure 3. Mongolian Text on Horizontal Lines


l'*avion* est-il [nisᵊx ongᵊc] нисэх онгоц, litt. la *barque* *à voler*, cependant que le *stade* est [cengᵊldᵊx xürelᵊn] цэнгэлдэх хүрээлэн, litt. l'*enceinte* *à (pour) se distraire*. La valeur *future* est évidemment un cas particulier de ce sens général, comme dans l'*an prochain* [irᵊx žil] ирэх жил (l'*année* *à venir*).

The Unicode 7.0 code charts changed the orientation of characters for Mongolian and Phags-pa by rotating counterclockwise so that they match the orientation in horizontal lines. This change makes the code charts more consistent with other scripts in terms of the orientation of characters. It also aligns the code charts with many recent rendering systems such as OpenType, and therefore it is expected to make implementations of the property easier. However, implementations should be aware that underlying rendering systems may not have exactly the same orientation of characters as the code charts.

While this property defines only default orientations compared to the code charts, high-level protocols or applications could combine information provided in a font's tables with the property values to more reliably calculate in which orientation they should render such glyphs, in order to achieve the desired visual result.

4 Glyphs Changes for Vertical Orientation

Table 3 provides representative glyphs for the horizontal and vertical appearance of characters with the Vertical_Orientation property values Tu and Tr.

The vertical glyphs that are shown in the table are exemplary, and their presence does not imply that font implementations should necessarily support them. Font developers should instead research the vertical glyph conventions for the intended regions to determine whether a vertical glyph is necessary for a particular character, and what the appropriate vertical glyph should be.

The Horizontal column may also specify more than one glyph when regional or other differences exist. Font developers should adhere to regional conventions when determining the appearance of horizontal glyphs.

Table 3. Glyph Changes for Vertical Orientation

Character	Horizontal	Vertical
U+2018 LEFT SINGLE QUOTATION MARK	‘	⸝ ⸜

Character	Horizontal	Vertical
U+2019 RIGHT SINGLE QUOTATION MARK	’	’
U+201C LEFT DOUBLE QUOTATION MARK	“	“
U+201D RIGHT DOUBLE QUOTATION MARK	”	”
U+2329 LEFT-POINTING ANGLE BRACKET	〈	〈
U+232A RIGHT-POINTING ANGLE BRACKET	〉	〉
U+3001 IDEOGRAPHIC COMMA	、	、
U+3002 IDEOGRAPHIC FULL STOP	。	。
U+3008 LEFT ANGLE BRACKET	〈	〈
U+3009 RIGHT ANGLE BRACKET	〉	〉
U+300A LEFT DOUBLE ANGLE BRACKET	《	《
U+300B RIGHT DOUBLE ANGLE BRACKET	》	》
U+300C LEFT CORNER BRACKET	「	「
U+300D RIGHT CORNER BRACKET	」	」
U+300E LEFT WHITE CORNER BRACKET	『	『
U+300F RIGHT WHITE CORNER BRACKET	』	』
U+3010 LEFT BLACK LENTICULAR BRACKET	【	【
U+3011 RIGHT BLACK LENTICULAR BRACKET	】	】
U+3014 LEFT TORTOISE SHELL BRACKET	〔	〔
U+3015 RIGHT TORTOISE SHELL BRACKET	〕	〕

Character	Horizontal	Vertical
U+3016 LEFT WHITE LENTICULAR BRACKET	〖	︗
U+3017 RIGHT WHITE LENTICULAR BRACKET	〗	︘
U+3018 LEFT WHITE TORTOISE SHELL BRACKET	〔	︙
U+3019 RIGHT WHITE TORTOISE SHELL BRACKET	〕	︚
U+301A LEFT WHITE SQUARE BRACKET	〚	︻
U+301B RIGHT WHITE SQUARE BRACKET	〛	︼
U+301C WAVE DASH	〜	︵
U+301D REVERSED DOUBLE PRIME QUOTATION MARK	〝	﹁
U+301E DOUBLE PRIME QUOTATION MARK	〞	﹂
U+301F LOW DOUBLE PRIME QUOTATION MARK	〟	﹂
U+3030 WAVY DASH	〰	︷
U+3041 HIRAGANA LETTER SMALL A	ぁ	ぁ
U+3043 HIRAGANA LETTER SMALL I	ぃ	ぃ
U+3045 HIRAGANA LETTER SMALL U	ぅ	ぅ
U+3047 HIRAGANA LETTER SMALL E	ぇ	ぇ
U+3049 HIRAGANA LETTER SMALL O	ぉ	ぉ
U+3063 HIRAGANA LETTER SMALL TU	っ	っ
U+3083 HIRAGANA LETTER SMALL YA	ゃ	ゃ
U+3085 HIRAGANA LETTER SMALL YU	ゅ	ゅ

Character	Horizontal	Vertical
U+3087 HIRAGANA LETTER SMALL YO	よ	よ
U+308E HIRAGANA LETTER SMALL WA	わ	わ
U+3095 HIRAGANA LETTER SMALL KA	か	か
U+3096 HIRAGANA LETTER SMALL KE	け	け
U+309B KATAKANA-HIRAGANA VOICED SOUND MARK	゛	゛
U+309C KATAKANA-HIRAGANA SEMI-VOICED SOUND MARK	゜	゜
U+30A0 KATAKANA-HIRAGANA DOUBLE HYPHEN	＝	‖
U+30A1 KATAKANA LETTER SMALL A	ア	ア
U+30A3 KATAKANA LETTER SMALL I	イ	イ
U+30A5 KATAKANA LETTER SMALL U	ウ	ウ
U+30A7 KATAKANA LETTER SMALL E	エ	エ
U+30A9 KATAKANA LETTER SMALL O	オ	オ
U+30C3 KATAKANA LETTER SMALL TU	ッ	ッ
U+30E3 KATAKANA LETTER SMALL YA	ャ	ャ
U+30E5 KATAKANA LETTER SMALL YU	ュ	ュ
U+30E7 KATAKANA LETTER SMALL YO	ョ	ョ
U+30EE KATAKANA LETTER SMALL WA	ヮ	ヮ
U+30F5 KATAKANA LETTER SMALL KA	ヵ	ヵ
U+30F6 KATAKANA LETTER SMALL KE	ヶ	ヶ

Character	Horizontal	Vertical
U+30FC KATAKANA-HIRAGANA PROLONGED SOUND MARK	ー	ー
U+3127 BOPOMOFO LETTER I	ㄧ	ㄧ
U+31B4 BOPOMOFO FINAL LETTER P	ㄆ	ㄆ
U+31B5 BOPOMOFO FINAL LETTER T	ㄉ	ㄉ
U+31B6 BOPOMOFO FINAL LETTER K	ㄎ	ㄎ
U+31B7 BOPOMOFO FINAL LETTER H	ㄏ	ㄏ
U+31BB BOPOMOFO FINAL LETTER G	ㄍ	ㄍ
U+31F0 KATAKANA LETTER SMALL KU	ク	ク
U+31F1 KATAKANA LETTER SMALL SI	シ	シ
U+31F2 KATAKANA LETTER SMALL SU	ス	ス
U+31F3 KATAKANA LETTER SMALL TO	ト	ト
U+31F4 KATAKANA LETTER SMALL NU	ヌ	ヌ
U+31F5 KATAKANA LETTER SMALL HA	ハ	ハ
U+31F6 KATAKANA LETTER SMALL HI	ヒ	ヒ
U+31F7 KATAKANA LETTER SMALL HU	フ	フ
U+31F8 KATAKANA LETTER SMALL HE	ヘ	ヘ
U+31F9 KATAKANA LETTER SMALL HO	ホ	ホ
U+31FA KATAKANA LETTER SMALL MU	ム	ム
U+31FB KATAKANA LETTER SMALL RA	ラ	ラ

Character	Horizontal	Vertical
U+31FC KATAKANA LETTER SMALL RI	リ	リ
U+31FD KATAKANA LETTER SMALL RU	ル	ル
U+31FE KATAKANA LETTER SMALL RE	レ	レ
U+31FF KATAKANA LETTER SMALL RO	ロ	ロ
U+32FF SQUARE ERA NAME REIWA	令和	令和
U+3300 SQUARE APAATO	アパート	アパート
U+3301 SQUARE ARUHUA	アルファ	アルファ
U+3302 SQUARE ANPEA	アンペア	アンペア
U+3303 SQUARE AARU	アール	アール
U+3304 SQUARE ININGU	イニング	イニング
U+3305 SQUARE INTI	インチ	インチ
U+3306 SQUARE UON	ウオン	ウオン
U+3307 SQUARE ESUKUUDO	エスクード	エスクード
U+3308 SQUARE EEKAA	エーカー	エーカー
U+3309 SQUARE ONSU	オンス	オンス
U+330A SQUARE OOMU	オーム	オーム
U+330B SQUARE KAIRI	カイリ	カイリ
U+330C SQUARE KARATTO	カラット	カラット
U+330D SQUARE KARORII	カロリー	カロリー

Character	Horizontal	Vertical
U+330E SQUARE GARON	ガロン	ガロン
U+330F SQUARE GANMA	ガンマ	ガンマ
U+3310 SQUARE GIGA	ギガ	ギガ
U+3311 SQUARE GINII	ギニー	ギニー
U+3312 SQUARE KYURII	キュリー	キュリー
U+3313 SQUARE GIRUDAA	ギルダー	ギルダー
U+3314 SQUARE KIRO	キロ	キロ
U+3315 SQUARE KIROGURAMU	キログラム	キログラム
U+3316 SQUARE KIROMEETORU	キロメートル	キロメートル
U+3317 SQUARE KIROWATTO	キロワット	キロワット
U+3318 SQUARE GURAMU	グラム	グラム
U+3319 SQUARE GURAMUTON	グラムトン	グラムトン
U+331A SQUARE KURUZEIRO	クルゼイロ	クルゼイロ
U+331B SQUARE KUROONE	クローネ	クローネ
U+331C SQUARE KEESU	ケース	ケース
U+331D SQUARE KORUNA	コルナ	コルナ
U+331E SQUARE KOOPO	コーポ	コーポ
U+331F SQUARE SAIKURU	サイクル	サイクル
U+3320 SQUARE SANTIIMU	サンチーム	サンチーム

Character	Horizontal	Vertical
U+3321 SQUARE SIRINGU	シリング	ングリシ
U+3322 SQUARE SENTI	センチ	チセン
U+3323 SQUARE SENTO	セント	トセン
U+3324 SQUARE DAASU	ダース	スダー
U+3325 SQUARE DESI	デシ	シデ
U+3326 SQUARE DORU	ドル	ルド
U+3327 SQUARE TON	トン	ント
U+3328 SQUARE NANO	ナノ	ノナ
U+3329 SQUARE NOTTO	ノット	トノッ
U+332A SQUARE HAITU	ハイツ	ツハイ
U+332B SQUARE PAASENTO	パーセント	セントパー
U+332C SQUARE PAATU	パーツ	ツパー
U+332D SQUARE BAARERU	バーレル	レルバー
U+332E SQUARE PIASUTORU	ピアストル	ストルピア
U+332F SQUARE PIKURU	ピクル	ルピク
U+3330 SQUARE PIKO	ピコ	コピ
U+3331 SQUARE BIRU	ビル	ルビ
U+3332 SQUARE HUARADDO	ファラッド	ラッドファ
U+3333 SQUARE HUIITO	フィート	トフィ

Character	Horizontal	Vertical
U+3334 SQUARE BUSSYERU	ブッシェル	ブッシェル
U+3335 SQUARE HURAN	フラン	フラン
U+3336 SQUARE HEKUTAARU	ヘクタール	ヘクタール
U+3337 SQUARE PESO	ペソ	ペソ
U+3338 SQUARE PENIHI	ペニヒ	ペニヒ
U+3339 SQUARE HERUTU	ヘルツ	ヘルツ
U+333A SQUARE PENSU	ペンス	ペンス
U+333B SQUARE PEEZI	ページ	ページ
U+333C SQUARE BEETA	ベータ	ベータ
U+333D SQUARE POINTO	ポイント	ポイント
U+333E SQUARE BORUTO	ボルト	ボルト
U+333F SQUARE HON	ホン	ホン
U+3340 SQUARE PONDO	ポンド	ポンド
U+3341 SQUARE HOORU	ホール	ホール
U+3342 SQUARE HOON	ホーン	ホーン
U+3343 SQUARE MAIKURO	マイクロ	マイクロ
U+3344 SQUARE MAIRU	マイル	マイル
U+3345 SQUARE MAHHA	マッハ	マッハ
U+3346 SQUARE MARUKU	マルク	マルク

Character	Horizontal	Vertical
U+3347 SQUARE MANSYON	マンション	マンション
U+3348 SQUARE MIKURON	ミクロン	ミクロン
U+3349 SQUARE MIRI	ミリ	ミリ
U+334A SQUARE MIRIBAARU	ミリバール	ミリバール
U+334B SQUARE MEGA	メガ	メガ
U+334C SQUARE MEETORU	メガトン	メガトン
U+334D SQUARE MEETORU	メートル	メートル
U+334E SQUARE YAADO	ヤード	ヤード
U+334F SQUARE YAARU	ヤール	ヤール
U+3350 SQUARE YUAN	ユアン	ユアン
U+3351 SQUARE RITTORU	リットル	リットル
U+3352 SQUARE RIRA	リラ	リラ
U+3353 SQUARE RUPII	ルピー	ルピー
U+3354 SQUARE RUUBURU	ルーブル	ルーブル
U+3355 SQUARE REMU	レム	レム
U+3356 SQUARE RENTOGEN	レントゲン	レントゲン
U+3357 SQUARE WATTO	ワット	ワット
U+337B SQUARE ERA NAME HEISEI	平成	平成
U+337C SQUARE ERA NAME SYOUWA	昭和	昭和

Character	Horizontal	Vertical
U+337D SQUARE ERA NAME TAISYOU	大正	大正
U+337E SQUARE ERA NAME MEIZI	明治	明治
U+337F SQUARE CORPORATION	株式会社	株式会社 会株社式
U+FE50 SMALL COMMA	，	， ，
U+FE51 SMALL IDEOGRAPHIC COMMA	、	、 、
U+FE52 SMALL FULL STOP	．	． ．
U+FE59 SMALL LEFT PARENTHESIS	(	︵
U+FE5A SMALL RIGHT PARENTHESIS	)	︶
U+FE5B SMALL LEFT CURLY BRACKET	{	︷
U+FE5C SMALL RIGHT CURLY BRACKET	}	︸
U+FE5D SMALL LEFT TORTOISE SHELL BRACKET	〔	︹
U+FE5E SMALL RIGHT TORTOISE SHELL BRACKET	〕	︺
U+FF01 FULLWIDTH EXCLAMATION MARK	！	！ ！
U+FF08 FULLWIDTH LEFT PARENTHESIS	(	︵
U+FF09 FULLWIDTH RIGHT PARENTHESIS	)	︶
U+FF0C FULLWIDTH COMMA	，	， ，
U+FF0E FULLWIDTH FULL STOP	．	． ．
U+FF1A FULLWIDTH COLON	：	： ： ：
U+FF1B FULLWIDTH SEMICOLON	；	； ； ；

Character	Horizontal	Vertical
U+FF1F FULLWIDTH QUESTION MARK	？	？ ？
U+FF3B FULLWIDTH LEFT SQUARE BRACKET	［	﹇
U+FF3D FULLWIDTH RIGHT SQUARE BRACKET	］	﹈
U+FF3F FULLWIDTH LOW LINE	＿	︿
U+FF5B FULLWIDTH LEFT CURLY BRACKET	｛	︷
U+FF5C FULLWIDTH VERTICAL LINE	｜	︱
U+FF5D FULLWIDTH RIGHT CURLY BRACKET	｝	︸
U+FF5E FULLWIDTH TILDE	～	︾
U+FF5F FULLWIDTH LEFT WHITE PARENTHESIS	｟	︵
U+FF60 FULLWIDTH RIGHT WHITE PARENTHESIS	｠	︶
U+FFE3 FULLWIDTH MACRON	￣	￨
U+16FE5 WHITE IDEOGRAPHIC COMMA	、	︑
U+16FE6 DOUBLE IDEOGRAPHIC FULL STOP	〆	︒ ︒
U+1B132 HIRAGANA LETTER SMALL KO	こ	こ
U+1B150 HIRAGANA LETTER SMALL WI	ゐ	ゐ
U+1B151 HIRAGANA LETTER SMALL WE	ゑ	ゑ
U+1B152 HIRAGANA LETTER SMALL WO	を	を
U+1B155 KATAKANA LETTER SMALL KO	コ	コ
U+1B164 KATAKANA LETTER SMALL WI	ヰ	ヰ

Character	Horizontal	Vertical
U+1B165 KATAKANA LETTER SMALL WE	㋀	㋀
U+1B166 KATAKANA LETTER SMALL WO	㋁	㋁
U+1B167 KATAKANA LETTER SMALL N	㋂	㋂
U+1B168 KATAKANA LETTER SMALL ARCHAIC YE	㋃	㋃
U+1F200 SQUARE HIRAGANA HOKA	ほか	ほか
U+1F201 SQUARED KATAKANA KOKO	🈁	🈁

5 Data File

Starting with Version 10.0.0 of the Unicode Standard, the data file listing the Vertical_Orientation property value assignments [Data50] is formally included in the Unicode Character Database [UCD]. (In Revisions 17 and prior of this specification, the data file was provided in versioned directories under the following stable URL: https://www.unicode.org/Public/vertical/)

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References

For references for this annex, see Unicode Standard Annex #41, "Common References for Unicode Standard Annexes."

Modifications

The following summarizes modifications from the previous ~~published version~~revision of this annex.

Revision 36

- **Proposed Update** for Unicode 19.0.0.
- Removed Koji Ishii as a co-editor.
- Table 3 was updated to add U+16FE5 and U+16FE6 (see UTC Action Items 188-A95 and 188-A102).
- The historical details in the Acknowledgments section were improved.

~~**Revision 35**~~

- ~~**Reissued** for Unicode 18.0.0.~~
- ~~Table 3 was updated to add a character that is now assigned the property value vo=Tu (U+1B168) (see UTC Consensus 185-C40).~~
- ~~Changes made in the data file for existing characters:~~
  - ~~Characters assigned the property value vo=R that were previously assigned the property value vo=U: U+1CEDD..U+1CEDF, U+1CEF1..U+1CEFD (see UTC Consensuses 185-C40, 186-C18, and 186-C31)~~
  - ~~Characters assigned the property value vo=U that were previously assigned the property value vo=R: U+1D250..U+1D281 (see UTC Consensus 185-C40)~~

Previous revisions can be accessed with the “Previous Version” link in the header.

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