

About the MVO of UTR # 50

Comments by Taro Yamamoto

1. Regarding the MVO in General

“2 Introduction” of UTR # 50 wrote:

In East Asia, Kanji and Kana characters are upright, Latin letters of acronyms are upright, while words and sentences in the Latin script are typically sideways, as can be seen in figure 3. The property Mixed Vertical Orientation documents the default orientation of characters in this scenario.

The Mixed Vertical Orientation should be referenced when Japanese texts are composed in vertical lines. The reason for this is simple: in ordinary Japanese, multiple scripts are used, and each script has its own set of conventions for text composition, and the tradition of Japanese typography defines how to compose characters of different source scripts in vertical lines.

However, it should be noted that not all characters of multiple source scripts necessarily have their Japanese vertical mode orientations (or postures: UPRIGHT and ROTATED, etc), because there are cases where any vertical Japanese usages have not yet been well established or stably, widely accepted in the communities of Japanese editors, typographers, and readers. In those cases, the orientation should be aligned to the direction of the parent vertical Japanese line. For example, an English word or sentence composed of multiple Latin alphabet characters tend to be rotated 90 degrees clockwise, although if it is composed of up to three or four characters, the characters’ posture can be UPRIGHT in the so-called TCY (Tate-Chu-Yoko) mode, or if only one character is used, a full-width character separately encoded in the Full-width and Half-width Forms and other sections of Unicode may be used to make it in the UPRIGHT posture.

The text quoted above says, “Latin letters of acronyms are upright, while words and sentences in the Latin script are typically sideways . . .” This seems to be a rather vague description, because even Latin letters of acronyms can be sideways, if such acronyms are followed by some related words or sentences de-

封筒には「To: David Thorogood, Esq.」と書いてあった。
パーソナルコンピュータを用いたDTPが普及した。

Figure 1

The right-side line has a rotated acronym, while the left-side line uses the acronym DTP in the upright posture.

scribed in Latin letters. You can see the point, if you look at **Figure 1** on the left side.

2. When can a character be in the UPRIGHT posture in Japanese vertical lines?

2.1. Half-width and Full-width Forms (and similar others)

First, it should be noted that proportional and full-width characters of some Latin alphabet characters and Arabic numbers are encoded, so that one can distinguish the proportional and full-width types by using ordinary Unicode characters. Traditionally, better or worse, with this double encoding policy, it has been possible to compose full-width Latin alphabet characters and Arabic numbers in the UPRIGHT posture in vertical lines, keeping the proportional ones -90 degrees rotated.

The same thing applies to symbols such as ! and ? listed in the Unicode section of the Half-width and Full-width Forms.

Some people say these Half-width and Full-width Forms should be abandoned, and we should not use these to distinguish the two types of metrics. Some other people insist that the scope of the Half-width and Full-width Forms should be expanded. My view about this is that in order to avoid compatibility problems, we should continue making these separately, doubly encoded characters all available, and keep using them as they are.

2.2. Arabic Numbers and Latin alphabet characters

In what ways can Arabic numbers and Latin alphabet characters be composed in the UPRIGHT posture in Japanese vertical lines? The author thinks the chief usages are limited to the following cases:

2.2.1. Usage 1: Newspapers and magazines

In newspaper and magazine articles, etc. full-width Arabic numbers and Latin alphabet characters are widely used for a range of small numbers or short words such as abbreviations. Still, because the standard line-length tends to be as short as eleven characters long in typical Japanese newspapers, it becomes necessary to rewrite big numbers into Chinese numbers, in order to keep a good level of readability.

Also, look at **Figure 2**. Because full-width numbers and Latin alphabet characters are designed mainly for stand-alone single-digit usages, they look extremely ugly when multiple successive digits are composed in the UPRIGHT posture. The vertical spaces between Arabic numbers have to be uneven and random, because no tuning is made to the vertical metrics of these glyphs in font. Japanese OpenType fonts may use the VORG GPOS feature to control the position of vertical Arabic numbers and Latin alphabet characters, but its main purpose is only to position each glyph within the EM body boundaries, and not to optimize the vertical spacing

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1501 年にイタリック体活字を創始した。

Figure 2

Only short words or small numbers can be used in the upright posture, or the spacing between characters look irregular and uneven. In this example, full-width Arabic numbers and Latin alphabet characters are used with the 'VORG' GPOS feature, and character collision was avoided. Without the OpenType® font feature, the result would have been destructively worse than this.

between multiple Latin alphabet characters composed in the UPRIGHT posture in vertical lines.

Also, today's fonts do not usually have any metrics information to optimally and optically center UPRIGHT Latin alphabet characters in vertical lines. In addition, even if it becomes possible to optimize the spacing of UPRIGHT Latin alphabet glyphs, the resulting composed characters' widths will be all proportional, and this may be a negative factor in optimizing the justification of the parent vertical line based on the Japanese EM-body-based grid system. No consideration about this issue has ever been made in the history of Western typography, because usually Western type has not been composed in the UPRIGHT posture in vertical lines.

2.2.2. Usage 2 TCY

A more widely accepted convention is TCY (Tate-Chu-Yoko), used for a limited number of digits in Arabic numbers or Latin alphabet characters. However, this method has the following problems.

2.2.2.1. Problem 1

As shown in **Figure 3**, this method requires the widths of Arabic number glyphs to be uniformed into precisely half the width of the EM body, or the widths of any two-digit numbers will exceed the left and right side boundaries of the EM body of the parent vertical line. Japanese OpenType supports this half-width capability through the 'hwid' GSUB feature.

2.2.2.2. Problem 2

More importantly, this method has a serious limitation. You cannot put more Arabic numbers than the space between the preceding and succeeding lines can allow. Usually, this method is used for two or three-digit numbers or words, although the limit can vary depending on the available space between lines. How can you handle large numbers?

Common to all these usages of Arabic numbers in the UPRIGHT posture in Japanese vertical lines, it can be said that all these have inherent, serious, typographic limitations. These are widely used as expedient methods, but due to the inherent limitations, these are not thought to be generally applicable methods of composing numbers in Japanese typography, however frequently they may be used.

A stand-alone, one-digit number or a single Latin alphabet character can be set in the UPRIGHT posture. For two or three-digit numbers, you can use TCY. This is true. However, any serious typographers know that, if possible, any numbers should be rewritten or trans-coded into their corresponding Chinese numbers for vertical lines. When Chinese numbers are used, half-width vertical Japanese commas should be used for delimiting digits. A decimal point can be represented by a middle-dot character. Also, use *katakana* characters to describe unit names, instead of using unit symbols or Latin alphabet characters. This is

縦中横は便利です。だけど、次のように太った数字が使われると、どこか気持ちが悪く感じますね。

A 私の誕生日は6月28日です。

二桁の数字は半角グリフで組むのが良いでしょう。

B 私の誕生日は6月28日です。

Figure 3

Both of the examples A and B use TCY to set the two-digit number '28'. But A simply uses proportional numbers fail to prevent the numbers exceed the left and right side EM box boundaries, while B with precisely half-width number glyphs accessible from the OpenType 'hwid' GSUB feature, succeeds in preventing the numbers from bloating.

わが国の政府債務は、二〇一一年九月末現在で、GDPの二・〇倍を超える約九五四兆円に達しているため、行政改革を推進して、いわゆるバラマキ行政などの無駄をなくし、優先度に応じて税金を有効に利用できる体制を確立する必要はある。ちなみに、米国の政府債務も一、一五〇兆円を超えている（二〇一一年五月末現在）。増税や赤字国債発行だけに頼らず、国家財政のスリム化が求められている。事情は日本と米国で共通している。

Figure 4

Chinese numbers are typically used in Japanese vertical lines. It is the most authentic style of typesetting numbers in vertical lines.

A
 タイポグラフィ、すなわち typography の歴史は長い。 Johannes Gutenberg が 1440 年代なかばに発明したのが始まりだ。ヴェニス の印刷者 Aldus Manutius は、1501 年にイタリック体活字を創始した。

B
 タイポグラフィ、すなわち typography の歴史は長い。 Johannes Gutenberg が一四四〇年代なかばに発明したのが始まりだ。ヴェニスの印刷者 Aldus Manutius は、一五〇一年にイタリック体活字を創始した。

the most authentic, traditional and generally applicable method of composing numbers in Japanese vertical lines (see **Figure 4**).

Some people may say that how texts should be prepared, rewritten or trans-coded should be decided by the editors or typographers who need to compose them, and that it has nothing to do with the vertical orientation that UTR # 50 tries to define.

The author completely agrees with this point. The author does not intend to make the UTR # 50 unnecessarily intervene in any decision making processes on the level of text preparation and writing. But if some people insist that it also should be decided solely by the editors or typographers, what default vertical orientation a character should have, and also that because the methods of using TCY and full-width numbers and Latin alphabet characters are widely used, they should be the standard default methods, and the UPRIGHT posture should be the default orientation for those characters in Japanese vertical lines, The author completely disagrees.

In the paragraphs above, the author has already discussed the reason why the author must disagree with the idea. To express it shortly, the reason is that any of the above-mentioned methods using UPRIGHT Arabic numbers or Latin alphabet characters in Japanese vertical lines are only expedient tricks, which work only for their limited uses, and may be useful only for what they are, and also that Arabic numbers and Latin alphabet characters in the UPRIGHT posture result in bad and ugly arrangements of characters due to the inevitable uneven spacing, when composed in vertical lines. Those characters are inherently not designed to be composed in vertical lines.

If you look at the example of UPRIGHT Arabic numbers and Latin alphabet characters composed in Japanese vertical lines in **Figure 5**, you will clearly see what the author means. It is impossible to compose Arabic numbers and Latin alphabet characters in the UPRIGHT posture with good letter spacing, because they are not designed to support the vertical writing direction from the beginning.

3. Symbols and abbreviations

Next, the author would like to discuss how we should handle symbols and abbreviations in Japanese vertical lines. the author has to admit that there are “gray zones”, where it is difficult to decide whether a symbol should be in the UP-

Figure 5

The example A has already been introduced in Figure 2. The same text can be better composed as shown in the example B above, which does not use upright vertical characters for Latin alphabet characters. Arabic numbers are rewritten in Chinese numbers.

RIGHT posture or ROTATED in Japanese vertical lines. So, the author thinks it is necessary to have a prioritizing rule set for the decision making.

3.1. “Would be UPRIGHT” priorities

Based on the above-mentioned considerations, the author thinks that characters’ “Would be UPRIGHT” tendencies in Japanese vertical lines can be evaluated according to the following prioritization rule.

3.1.1. “Would be Upright” Priorities:

U1: Chinese characters, Japanese *kana* characters and their related marks that need neither special glyph shapes nor different orientations in Japanese vertical lines.

U2: Full-width characters separately encoded from the proportional characters (in the Unicode Half-width and Full-width Forms section)

U3: Symbols and abbreviations that are mere pictures or geometric shapes without any directionality.

U4: Western-origin ligatures and abbreviations whose decomposed forms can be represented with ordinary Latin alphabet characters or Arabic numbers or symbols that are -90 degrees rotated in vertical lines.

3.1.2. “More Ambiguous” characters

U5 or R5: If a character has one or more similar characters, if the category of the character is narrower or more specialized than the others’, the posture of the others’ should be adopted. For example, if an *emoji* picture and a mathematical symbol resemble each other, but can have different vertical orientations, due to the original source fields (*emoji* and mathematics, etc), choose the greater, more popular field’s vertical orientation.

3.1.3. “Would be Rotated” Priorities

R1: Latin alphabet characters, Arabic numbers, and related proportional punctuations and marks.

R2: Proportional characters separately encoded from the full-width characters (in the Unicode Half-width and Full-width Forms section and others)

R3: Standard multi-purpose, parentheses, punctuations and symbols with directionality (arrows and symbols for musical notations, etc).

R4: Symbols and abbreviations that are originated in Western typography or writing systems.

This rule set is based on the same criteria as those the author has used to decide the vertical postures of Arabic numbers and Latin alphabet characters, viz. to

avoid as many typographically problematic cases as possible, and to avoid as many possibilities of creating aesthetically bad results as possible.

For example, symbols like the c/o (care of) abbreviation character (U+2105) are pure Western-originated symbols. There is no practical usages for this symbol in Japan, except the cases where it is self-referenced in the sentences like: 「この%記号は気付と同じ意味です」(This % symbol has the same meaning as that of「気付」in Japanese). There is no reason for this character's being set in the UPRIGHT posture in vertical lines, in many cases. There are many similar Western-originated symbols like this.

4. Conclusion

The main purpose of this document is to propose a reasonably defined list of Japanese vertical character orientations, which can be referenced as the default character orientations for representing characters in Japanese vertical lines.

As mentioned in one of the previous sections, there are different styles of Japanese character representation for various purposes, and it is impossible to uniform them. Depending on the usages, a character can have different postures or orientations in Japanese vertical lines.

However, it is possible not to select as the default, standard usages the usages that are mere expedient tricks and have inherent limitations, and the usages that tend to result in bad typography for some reason (for example, because of the lack of any traditional conventions to compose the characters in Japanese vertical lines, or the lack of some needed metrics information in font, etc).

In many cases, there have not been established conventional styles for composing Arabic numbers, Latin alphabet characters, and other symbols or abbreviations that were originated in Western typography in Japanese vertical lines. They tend to be badly represented typographically, visually or optically, if they are simply composed and displayed in the UPRIGHT posture in Japanese vertical lines. All these must not be composed in the UPRIGHT posture by default, though the users should be given a method to tailor or customize the character orientations. Instead, their orientations should be defined, so that their original baseline directions can be aligned with the writing direction of the main vertical line. Typically, Latin alphabet characters that are encoded not as full-width characters for Japanese usages should be rotated clockwise.

The author's aim was to find a reasonable set of vertical orientations defined for Unicode characters, with which we can avoid undesirable typographical effects. Once a set of default orientations is defined, people tend to accept it as is, and start regarding it as the standard set of orientations, as time goes by, even if it is possible for them to customize or modify it. For example, if we define all Latin alphabet and Arabic numbers and related symbols to be UPRIGHT in Japanese vertical lines, by default, not a few people will start making Latin alphabet characters and Arabic numbers always in the UPRIGHT posture in Japanese vertical lines, forgetting that the most authentic editorial method to handle Arabic numbers in vertical lines is to rewrite or trans-code them into Chinese numbers. Such people will lose the opportunity to learn and remember

the traditional, authentic style with which they can create better typography in your web applications. On the other hand, they will soon propagate their own style of typography as something “default” or “standard”, and will suffer from the resulting negative effects of abusing UPRIGHT non-Japanese characters in Japanese vertical lines.

Of course, as far as it is done with thorough understanding of Japanese typography, the author agrees that there are many cases where TCY, Latin alphabet and Arabic numbers can be used effectively in the UPRIGHT posture. But such styles should be used by skilled typographers and designers carefully, through the methods of explicit tagging or in some other ways. Such tricks should not be put into the default or standard set exposed to anyone.

Based on these, the author thinks it incredible that some people today insist that most Western-originated, Latin Alphabet characters, Arabic numbers and symbols and abbreviations should have the UPRIGHT posture in Japanese vertical lines by default. Such a proposal will be effective only in amplifying the risk of misleading users and developers about Japanese typography and how to compose characters in vertical lines.

The main text above was written by
Taro Yamamoto.

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v1.14 2012/07/01
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v1.01 2012/06/29

4. Vertical Orientations

Here, I would like to try to use the above-mentioned priorities to some characters, which seem to be ambiguous about the vertical orientations.

The last column shows each character's vertical orientation marked as R, U or Tu. The Tu instances are inherited from the original database of UTR # 50, and the priorities from R1 to R5, and from U1 to U5 are marked as R and U respectively.

The first column also shows orientations, but they are the same as those in the original database of UTR # 50, and not part of this proposal.

			Proposed vertical orientations	
				↓
R	0000 .. 001F	..	1	R
R	20	SPACE	2	R
R	21	! EXCLAMATION MARK	3	R
R	22	" QUOTATION MARK	4	R
R	23	# NUMBER SIGN	5	R
R	24	\$ DOLLAR SIGN	6	R
R	25	% PERCENT SIGN	7	R
R	26	& AMPERSAND	8	R
R	27	' APOSTROPHE	9	R
R	28	(LEFT PARENTHESIS	10	R
R	29	) RIGHT PARENTHESIS	11	R
R	002A	* ASTERISK	12	R
R	002B	+ PLUS SIGN	13	R
R	002C	, COMMA	14	R
R	002D	- HYPHEN-MINUS	15	R
R	002E .. 005A	. . . Z FULL STOP .. LATIN CAPITAL LETTER Z	16	R
R	005B	[LEFT SQUARE BRACKET	17	R
R	005C	¥ REVERSE SOLIDUS	18	R
R	005D	] RIGHT SQUARE BRACKET	19	R
R	005E	^ CIRCUMFLEX ACCENT	20	R
R	005F	_ LOW LINE	21	R
R	0060 .. 007A	' .. z GRAVE ACCENT .. LATIN SMALL LETTER Z	22	R
R	007B	{ LEFT CURLY BRACKET	23	R
R	007C	| VERTICAL LINE	24	R
R	007D	} RIGHT CURLY BRACKET	25	R
R	007E	~ TILDE	26	R
R	007F .. 009F	☒ .. Ÿ ..	27	R
R	00A0	NO-BREAK SPACE	28	R
R	00A1	¡ INVERTED EXCLAMATION MARK	29	R
R	00A2	¢ CENT SIGN	30	R
R	00A3	£ POUND SIGN	31	R
R	00A4	¤ CURRENCY SIGN	32	R
R	00A5	¥ YEN SIGN	33	R
R	00A6	‡ BROKEN BAR	34	R
U	00A7	§ SECTION SIGN	35	R
R	00A8	¨ DIAERESIS	36	R

U	00A9	©	COPYRIGHT SIGN	37	R
R	00AA	ª	FEMININE ORDINAL INDICATOR	38	R
R	00AB	«	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK	39	R
R	00AC	¬	NOT SIGN	40	R
R	00AD	–	SOFT HYPHEN	41	R
U	00AE	®	REGISTERED SIGN	42	R
R	00AF	ˉ	MACRON	43	R
U	00B0	°	DEGREE SIGN	44	R
U	00B1	±	PLUS-MINUS SIGN	45	R
R	00B2	²	SUPERSCRIPIT TWO	46	R
R	00B3	³	SUPERSCRIPIT THREE	47	R
R	00B4	´	ACUTE ACCENT	48	R
R	00B5	µ	MICRO SIGN	49	R
U	00B6	¶	PILCROW SIGN	50	R
R	00B7	·	MIDDLE DOT	51	R
R	00B8	¸	CEDILLA	52	R
R	00B9	¹	SUPERSCRIPIT ONE	53	R
R	00BA	º	MASCULINE ORDINAL INDICATOR	54	R
R	00BB	»	RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK	55	R
U	00BC	¼	VULGAR FRACTION ONE QUARTER	56	U
U	00BD	½	VULGAR FRACTION ONE HALF	57	U
U	00BE	¾	VULGAR FRACTION THREE QUARTERS	58	U
R	00BF	¿	INVERTED QUESTION MARK	59	R
R	00C0 .. 00D6	À .. Ö	LATIN CAPITAL LETTER A WITH GRAVE .. LATIN CAPITAL LETTER O WITH DIAERESIS	60	R
U	00D7	×	MULTIPLICATION SIGN	61	R
R	00D8 .. 00F6	Ø .. ö	LATIN CAPITAL LETTER O WITH STROKE .. LATIN SMALL LETTER O WITH DIAERESIS	62	R
U	00F7	÷	DIVISION SIGN	63	R
R	00F8 .. 00FF	ø .. ÿ	LATIN SMALL LETTER O WITH STROKE .. LATIN SMALL LETTER Y WITH DIAERESIS	64	R
R	0100..017F		Latin Extended-A	65	R
R	0180..024F		Latin Extended-B	66	R
R	0250..02AF		IPA Extensions	67	R
R	02B0 .. 02E4	Ɀ .. Ɀ	MODIFIER LETTER SMALL H .. MODIFIER LETTER SMALL REVERSED GLOTTAL STOP	68	R
U	02E5	Ɀ	MODIFIER LETTER EXTRA-HIGH TONE BAR	69	U
U	02E6	Ɀ	MODIFIER LETTER HIGH TONE BAR	70	U
U	02E7	Ɀ	MODIFIER LETTER MID TONE BAR	71	U
U	02E8	Ɀ	MODIFIER LETTER LOW TONE BAR	72	U
U	02E9	Ɀ	MODIFIER LETTER EXTRA-LOW TONE BAR	73	U
U	02EA	Ɀ	MODIFIER LETTER YIN DEPARTING TONE MARK	74	U
U	02EB	Ɀ	MODIFIER LETTER YANG DEPARTING TONE MARK	75	U
R	02EC .. 02FF	Ɀ .. Ɀ	MODIFIER LETTER VOICING .. MODIFIER LETTER LOW LEFT ARROW	76	R
R	0300..036F		Combining Diacritical Marks	77	R
R	0370..03FF		Greek and Coptic	78	R
R	0400..04FF		Cyrillic	79	R
R	0500..052F		Cyrillic Supplement	80	R
R	0530 .. 0589	Ɀ .. Ɀ	.. ARMENIAN FULL STOP	8 1	

R					
R	058A	<input checked="" type="checkbox"/>	ARMENIAN HYPHEN	82	R
R	058B .. 058F	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		.. ARMENIAN DRAM SIGN	8 3
R					
R	0590 .. 05BD	<input checked="" type="checkbox"/> .. <input type="checkbox"/>		.. HEBREW POINT METEG	8 4
R					
R	05BE	<input checked="" type="checkbox"/>	HEBREW PUNCTUATION MAQAF	85	R
R	05BF .. 05FF	<input type="checkbox"/> .. <input checked="" type="checkbox"/>		HEBREW POINT RAFE ..	8 6
R					
R	0600..06FF		Arabic	87	R
R	0700..074F		Syriac	88	R
R	0750..077F		Arabic Supplement	89	R
R	0780..07BF		Thaana	90	R
R	07C0..07FF		NKo	91	R
R	0800..083F		Samaritan	92	R
R	0840..085F		Mandaic	93	R
R	0860 .. 089F	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		.. 94	R
R	08A0..08FF		Arabic Extended-A	95	R
R	0900..097F		Devanagari	96	R
R	0980..09FF		Bengali	97	R
R	0A00..0A7F		Gurmukhi	98	R
R	0A80..0AFF		Gujarati	99	R
R	0B00..0B7F		Oriya	100	R
R	0B80..0BFF		Tamil	101	R
R	0C00..0C7F		Telugu	102	R
R	0C80..0CFF		Kannada	103	R
R	0D00..0D7F		Malayalam	104	R
R	0D80..0DFF		Sinhala	105	R
R	0E00..0E7F		Thai	106	R
R	0E80..0EFF		Lao	107	R
R	0F00..0FFF		Tibetan	108	R
R	1000..109F		Myanmar	109	R
R	10A0..10FF		Georgian	110	R
U	1100..11FF		Hangul Jamo	111	U
R	1200..137F		Ethiopic	112	R
R	1380..139F		Ethiopic Supplement	113	R
R	13A0..13FF		Cherokee	114	R
R	1400	<input checked="" type="checkbox"/>	CANADIAN SYLLABICS HYPHEN	115	R
U	1401 .. 167F	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		CANADIAN SYLLABICS E .. CANADIAN	
	SYLLABICS BLACKFOOT W	116	R		
R	1680..169F		Ogham	117	R
R	16A0..16FF		Runic	118	R
R	1700..171F		Tagalog	119	R
R	1720..173F		Hanunoo	120	R
R	1740..175F		Buhid	121	R
R	1760..177F		Tagbanwa	122	R
R	1780..17FF		Khmer	123	R
U	1800..18AF		Mongolian	124	U
U	18B0..18FF		Unified Canadian Aboriginal Syllabics Extended	125	R
R	1900..194F		Limbu	126	R
R	1950..197F		Tai Le	127	R

R	1980..19DF	New Tai Lue	128	R
R	19E0..19FF	Khmer Symbols	129	R
R	1A00..1A1F	Buginese	130	R
R	1A20..1AAF	Tai Tham	131	R
R	1B00..1B7F	Balinese	132	R
R	1B80..1BBF	Sundanese	133	R
R	1BC0..1BFF	Batak	134	R
R	1C00..1C4F	Lepcha	135	R
R	1C50..1C7F	Ol Chiki	136	R
R	1CC0..1CCF	Sundanese Supplement	137	R
R	1CD0..1CFF	Vedic Extensions	138	R
R	1D00..1D7F	Phonetic Extensions	139	R
R	1D80..1DBF	Phonetic Extensions Supplement	140	R
R	1DC0..1DFF	Combining Diacritical Marks Supplement	141	R
R	1E00..1EFF	Latin Extended Additional	142	R
R	1F00..1FFF	Greek Extended	143	R
R	2000 .. 200A	..	EN QUAD .. HAIR SPACE	1 4 4
R	200B .. 200F	..	ZERO WIDTH SPACE .. RIGHT-TO-LEFT	
MARK	145	R		
R	2010	- HYPHEN	146	R
R	2011	- NON-BREAKING HYPHEN	147	R
R	2012	- FIGURE DASH	148	R
R	2013	- EN DASH	149	R
R	2014	- EM DASH	150	R
R	2015	— HORIZONTAL BAR	151	R
U	2016	|| DOUBLE VERTICAL LINE	152	R
U	2017	= DOUBLE LOW LINE	153	R
T	2018	' LEFT SINGLE QUOTATION MARK	154	R
T	2019	' RIGHT SINGLE QUOTATION MARK	155	R
R	201A	' SINGLE LOW-9 QUOTATION MARK	156	R
R	201B	' SINGLE HIGH-REVERSED-9 QUOTATION MARK	157	R
R	201C	“ LEFT DOUBLE QUOTATION MARK	158	R
R	201D	” RIGHT DOUBLE QUOTATION MARK	159	R
R	201E	„ DOUBLE LOW-9 QUOTATION MARK	160	R
R	201F	“ DOUBLE HIGH-REVERSED-9 QUOTATION MARK	161	R
U	2020	† DAGGER	162	R
U	2021	‡ DOUBLE DAGGER	163	R
U	2022	· BULLET	164	R
U	2023	‣ TRIANGULAR BULLET	165	R
U	2024	. ONE DOT LEADER	166	R
R	2025	.. TWO DOT LEADER	167	R
R	2026	... HORIZONTAL ELLIPSIS	168	R
R	2027	· HYPHENATION POINT	169	R
R	2028 .. 2029	..	LINE SEPARATOR .. PARAGRAPH SEPARATOR	
170	R			
R	202A .. 202E	..	LEFT-TO-RIGHT EMBEDDING .. RIGHT-TO-	
LEFT	OVERRIDE	171	R	
R	202F	NARROW NO-BREAK SPACE	172	R
U	2030	‰ PER MILLE SIGN	173	R
U	2031	‱ PER TEN THOUSAND SIGN	174	R

U	2032	'	PRIME	175	R
U	2033	''	DOUBLE PRIME	176	R
U	2034	'''	TRIPLE PRIME	177	R
U	2035	`	REVERSED PRIME	178	R
U	2036	``	REVERSED DOUBLE PRIME	179	R
U	2037	'''	REVERSED TRIPLE PRIME	180	R
R	2038	^	CARET	181	R
R	2039	'	SINGLE LEFT-POINTING ANGLE QUOTATION MARK	182	R
R	203A	'	SINGLE RIGHT-POINTING ANGLE QUOTATION MARK		183 R
U	203B	⌘	REFERENCE MARK	184	U
U	203C	!!	DOUBLE EXCLAMATION MARK	185	U
U	203D	?	INTERROBANG	186	R
R	203E	-	OVERLINE	187	R
R	203F	~	UNDERTIE	188	R
R	2040	~	CHARACTER TIE	189	R
R	2041	^	CARET INSERTION POINT	190	R
U	2042	*	ASTERISM	191	R
U	2043	-	HYPHEN BULLET	192	R
R	2044	/	FRACTION SLASH	193	U
R	2045	[	LEFT SQUARE BRACKET WITH QUILL	194	R
R	2046	]	RIGHT SQUARE BRACKET WITH QUILL	195	R
U	2047	??	DOUBLE QUESTION MARK	196	U
U	2048	?!	QUESTION EXCLAMATION MARK	197	U
U	2049	!?	EXCLAMATION QUESTION MARK	198	U
R	204A	⊠	TIRONIAN SIGN ET	199	R
R	204B	⊠	REVERSED PILCROW SIGN	200	R
R	204C	⊠	BLACK LEFTWARDS BULLET	201	R
R	204D	⊠	BLACK RIGHTWARDS BULLET	202	R
R	204E	⊠	LOW ASTERISK	203	R
R	204F	⊠	REVERSED SEMICOLON	204	R
R	2050	⊠	CLOSE UP	205	R
U	2051	* *	TWO ASTERISKS ALIGNED VERTICALLY	206	R
R	2052	⊠	COMMERCIAL MINUS SIGN	207	R
R	2053	⊠	SWUNG DASH	208	R
R	2054	⊠	INVERTED UNDERTIE	209	R
R	2055	⊠	FLOWER PUNCTUATION MARK	210	R
R	2056	⊠	THREE DOT PUNCTUATION	211	R
U	2057	⊠	QUADRUPLE PRIME	212	R
R	2058	⊠	FOUR DOT PUNCTUATION	213	R
R	2059	⊠	FIVE DOT PUNCTUATION	214	R
R	205A	:	TWO DOT PUNCTUATION	215	R
R	205B	⊠	FOUR DOT MARK	216	R
R	205C	⊠	DOTTED CROSS	217	R
R	205D	:	TRICOLON	218	R
R	205E	⊠	VERTICAL FOUR DOTS	219	R
R	205F		MEDIUM MATHEMATICAL SPACE	220	R
R	2060 .. 2064	⊠ .. ⊠	WORD JOINER .. INVISIBLE PLUS		
221	R				
U	2065	⊠		222	U
U	2066	⊠		223	U
U	2067	⊠		224	U

U	2068	☒		225	U
U	2069	☒		226	U
R	206A .. 206F	☒ .. ☒		INHIBIT SYMMETRIC SWAPPING .. NOMINAL	
	DIGIT SHAPES		227 R		
R	2070..209F		Superscripts and Subscripts	228	R
U	20A0 .. 20AB	€ .. ¢		EURO-CURRENCY SIGN .. DONG SIGN	
229	R				
U	20AC	€	EURO SIGN	230	R
U	20AD .. 20CF	Ɔ .. ☒		KIP SIGN .. 231 R	
U	20D0..20FF		Combining Diacritical Marks for Symbols	232	R
U	2100	%	ACCOUNT OF	233	R
U	2101	%	ADDRESSED TO THE SUBJECT	234	R
U	2102	Ⓒ	DOUBLE-STRUCK CAPITAL C	235	R
U	2103	°C	DEGREE CELSIUS	236	U
U	2104	⊕	CENTRE LINE SYMBOL	237	R
U	2105	%	CARE OF	238	R
U	2106	‰	CADA UNA	239	R
U	2107	ε	EULER CONSTANT	240	R
U	2108	∅	SCRUPLE	241	R
U	2109	°F	DEGREE FAHRENHEIT	242	U
U	210A	ƒ	SCRIPT SMALL G	243	R
U	210B	℥	SCRIPT CAPITAL H	244	R
U	210C	Ⓢ	BLACK-LETTER CAPITAL H	245	R
U	210D	Ⓜ	DOUBLE-STRUCK CAPITAL H	246	R
U	210E	ℏ	PLANCK CONSTANT	247	R
U	210F	ℏ	PLANCK CONSTANT OVER TWO PI	248	R
U	2110	ɣ	SCRIPT CAPITAL I	249	R
U	2111	Ⓜ	BLACK-LETTER CAPITAL I	250	R
U	2112	ℓ	SCRIPT CAPITAL L	251	R
U	2113	ℓ	SCRIPT SMALL L	252	R
U	2114	ℓ̄	L B BAR SYMBOL	253	R
U	2115	Ⓝ	DOUBLE-STRUCK CAPITAL N	254	R
U	2116	No.	NUMERO SIGN	255	U
U	2117	Ⓢ	SOUND RECORDING COPYRIGHT	256	R
R	2118	Ⓟ	SCRIPT CAPITAL P	257	R
U	2119	Ⓟ	DOUBLE-STRUCK CAPITAL P	258	R
U	211A	Ⓠ	DOUBLE-STRUCK CAPITAL Q	259	R
U	211B	Ⓡ	SCRIPT CAPITAL R	260	R
U	211C	Ⓡ	BLACK-LETTER CAPITAL R	261	R
U	211D	Ⓡ	DOUBLE-STRUCK CAPITAL R	262	R
U	211E	℞	PRESCRIPTION TAKE	263	R
U	211F	Ⓡ	RESPONSE	264	R
U	2120	SM	SERVICE MARK	265	R
U	2121	TEL	TELEPHONE SIGN	266	U
U	2122	™	TRADE MARK SIGN	267	R
U	2123	✚	VERSICLE	268	R
U	2124	Ⓩ	DOUBLE-STRUCK CAPITAL Z	269	R
U	2125	℥	OUNCE SIGN	270	R
U	2126	Ω	OHM SIGN	271	R
U	2127	Ω	INVERTED OHM SIGN	272	R
U	2128	Ⓩ	BLACK-LETTER CAPITAL Z	273	R

U	2129	ɿ	TURNED GREEK SMALL LETTER IOTA	274	R
U	212A	K	KELVIN SIGN	275	R
U	212B	Å	ANGSTROM SIGN	276	R
U	212C	Ɔ	SCRIPT CAPITAL B	277	R
U	212D	Ⓒ	BLACK-LETTER CAPITAL C	278	R
U	212E	e	ESTIMATED SYMBOL	279	R
U	212F	e	SCRIPT SMALL E	280	R
U	2130	ɛ	SCRIPT CAPITAL E	281	R
U	2131	ƒ	SCRIPT CAPITAL F	282	R
U	2132	Ɔ	TURNED CAPITAL F	283	R
U	2133	ℳ	SCRIPT CAPITAL M	284	R
U	2134	o	SCRIPT SMALL O	285	R
U	2135	ℵ	ALEF SYMBOL	286	R
U	2136	ⱱ	BET SYMBOL	287	R
U	2137	Ɀ	GIMEL SYMBOL	288	R
U	2138	ⱸ	DALET SYMBOL	289	R
U	2139	i	INFORMATION SOURCE	290	U
U	213A	⊠	ROTATED CAPITAL Q	291	U
U	213B	ⓧ	FACSIMILE SIGN	292	U
U	213C	⊠	DOUBLE-STRUCK SMALL PI	293	R
U	213D	⊠	DOUBLE-STRUCK SMALL GAMMA	294	R
U	213E	⊠	DOUBLE-STRUCK CAPITAL GAMMA	295	R
U	213F	⊠	DOUBLE-STRUCK CAPITAL PI	296	R
R	2140	∑	DOUBLE-STRUCK N-ARY SUMMATION	297	R
R	2141	⊠	TURNED SANS-SERIF CAPITAL G	298	R
R	2142	⊠	TURNED SANS-SERIF CAPITAL L	299	R
R	2143	⊠	REVERSED SANS-SERIF CAPITAL L	300	R
R	2144	⊠	TURNED SANS-SERIF CAPITAL Y	301	R
U	2145	D	DOUBLE-STRUCK ITALIC CAPITAL D	302	R
U	2146	d	DOUBLE-STRUCK ITALIC SMALL D	303	R
U	2147	e	DOUBLE-STRUCK ITALIC SMALL E	304	R
U	2148	i	DOUBLE-STRUCK ITALIC SMALL I	305	R
U	2149	j	DOUBLE-STRUCK ITALIC SMALL J	306	R
U	214A	⊠	PROPERTY LINE	307	R
R	214B	⊠	TURNED AMPERSAND	308	R
U	214C	⊠	PER SIGN	309	R
U	214D	⊠	AKTIESELSKAB	310	R
U	214E	⊠	TURNED SMALL F	311	R
U	214F	⊠	SYMBOL FOR SAMARITAN SOURCE	312	R
U	2150..218F		Number Forms	313	U
R	2190..21FF		Arrows	314	R
R	2200..22FF		Mathematical Operators	315	R
U	2300 .. 2307	⊠ .. }		DIAMETER SIGN .. WAVY LINE	3 1 6
U					
R	2308 .. 230B	⊠ .. ⊠		LEFT CEILING .. RIGHT FLOOR	3 1 7
R					
U	230C .. 231F	⊠ .. ⊠		BOTTOM RIGHT CROP .. BOTTOM RIGHT	
CORNER		318 U			
R	2320	∫	TOP HALF INTEGRAL	319	R
R	2321	∫	BOTTOM HALF INTEGRAL	320	R
U	2322 .. 2328	⊠ .. ⊠		FROWN .. KEYBOARD	321 U

U	2329	☒	LEFT-POINTING ANGLE BRACKET	322	U
U	232A	☒	RIGHT-POINTING ANGLE BRACKET	323	U
U	232B	☒	ERASE TO THE LEFT	324	U
R	232C .. 237C	☒ .. ☒		BENZENE RING .. RIGHT ANGLE WITH	
	DOWNWARDS ZIGZAG ARROW	325	R	SHOULDERED OPEN BOX .. CLEAR SCREEN	
U	237D .. 239A	☒ .. ☒		LEFT PARENTHESIS UPPER HOOK ..	
	SYMBOL	326	U	TOP SQUARE BRACKET .. BOTTOM SQUARE	
R	239B .. 23B3	/ .. ☒		328	U
	SUMMATION BOTTOM	327	R	RADICAL SYMBOL BOTTOM .. RIGHT	
U	23B4 .. 23B6	☒ .. ☒		HORIZONTAL SCAN LINE-1 .. EJECT	
	BRACKET OVER TOP SQUARE BRACKET			331	R
R	23B7 .. 23B9	☒ .. ☒		METRICAL BREVE .. FUSE 3 3 2	
	VERTICAL BOX LINE	329	R	TOP PARENTHESIS .. BOTTOM TORTOISE	
U	23BA .. 23CF	☒ .. ☒		WHITE TRAPEZIUM .. 334 U	
	SYMBOL	330	U	335	U
R	23D0	☒	VERTICAL LINE EXTENSION	336	U
U	23D1 .. 23DB	☒ .. ☒		337	U
U				338	R
R	23DC .. 23E1	☒ .. ☒		339	R
	SHELL BRACKET	333	R	340	R
U	23E2 .. 23FF	☒ .. ☒		BLACK SUN WITH RAYS .. REVERSED	
U	2400..243F		Control Pictures	U	
U	2440..245F		Optical Character Recognition		
U	2460..24FF		Enclosed Alphanumerics		
R	2500..257F		Box Drawing		
R	2580..259F		Block Elements		
R	25A0..25FF		Geometric Shapes		
U	2600 .. 2619	☀ .. ☒		BLACK LEFT POINTING INDEX .. WHITE	
	ROTATED FLORAL HEART BULLET	341		SKULL AND CROSSBONES .. WHITE FLAG	
R	261A .. 261F	☞ .. ☞		343	U
	DOWN POINTING INDEX	342	R	.. ROTATED FLORAL HEART BULLET	
U	2620 .. 26FF	☞ .. ☒		MEDIUM LEFT PARENTHESIS ORNAMENT ..	
	WITH HORIZONTAL MIDDLE BLACK STRIPE			345	R
U	2700 .. 2767	☒ .. ☞		DINGBAT NEGATIVE CIRCLED DIGIT ONE ..	
		344	U	346	U
U	2768 .. 2775	☒ .. ☒		HEAVY WIDE-HEADED RIGHTWARDS ARROW ..	
	MEDIUM RIGHT CURLY BRACKET ORNAMENT			THREE DIMENSIONAL ANGLE .. OPEN	
U	2776 .. 2793	① .. ⑩		LEFT S-SHAPED BAG DELIMITER .. RIGHT	
	DINGBAT NEGATIVE CIRCLED SANS-SERIF NUMBER TEN			OR WITH DOT INSIDE .. WHITE SQUARE	
R	2794 .. 27BF	➔ .. ☒		MATHEMATICAL LEFT WHITE SQUARE	
	DOUBLE CURLY LOOP	347	R	351	R
R	27C0 .. 27C4	☒ .. ☒		352	R
	SUPERSET	348	R	353	R
R	27C5 .. 27C6	☒ .. ☒			
	S-SHAPED BAG DELIMITER	349	R		
R	27C7 .. 27E5	☒ .. ☒			
	WITH RIGHTWARDS TICK	350	R		
R	27E6 .. 27EF	☒ .. ☒			
	BRACKET .. MATHEMATICAL RIGHT FLATTENED PARENTHESIS				
R	27F0..27FF		Supplemental Arrows-A		
U	2800..28FF		Braille Patterns		

R	2900..297F	Supplemental Arrows-B	354	R
R	2980 .. 2982	☒ .. ☒	TRIPLE VERTICAL BAR DELIMITER .. Z	
	NOTATION TYPE COLON	355 R		
R	2983 .. 2998	☒ .. ☒		LEFT WHITE CURLY BRACKET .. RIGHT
	BLACK TORTOISE SHELL BRACKET		356	R
R	2999 .. 29D7	☒ .. ☒		DOTTED FENCE .. BLACK HOURGLASS
	357 R			
R	29D8 .. 29DB	☒ .. ☒		LEFT WIGGLY FENCE .. RIGHT DOUBLE
	WIGGLY FENCE	358 R		
R	29DC .. 29FB	☒ .. #		INCOMPLETE INFINITY .. TRIPLE PLUS
	359 R			
R	29FC .. 29FD	☒ .. ☒		LEFT-POINTING CURVED ANGLE BRACKET ..
	RIGHT-POINTING CURVED ANGLE BRACKET		360	R
R	29FE .. 29FF	☒ .. ☒		TINY .. MINY 361 R
R	2A00..2AFF	Supplemental Mathematical Operators	362	R
R	2B00 .. 2B11	☒ .. ☒		NORTH EAST WHITE ARROW .. LEFTWARDS
	ARROW WITH TIP UPWARDS	363 R		
U	2B12 .. 2B2F	☒ .. ☒		SQUARE WITH TOP HALF BLACK .. WHITE
	VERTICAL ELLIPSE	364 U		
R	2B30 .. 2B4C	☒ .. ☒		LEFT ARROW WITH SMALL CIRCLE ..
	RIGHTWARDS ARROW ABOVE REVERSE TILDE OPERATOR		365	R
U	2B4D .. 2BFF	☒ .. ☒		.. 366 U
R	2C00..2C5F	Glagolitic	367	R
R	2C60..2C7F	Latin Extended-C	368	R
R	2C80..2CFF	Coptic	369	R
R	2D00..2D2F	Georgian Supplement	370	R
R	2D30..2D7F	Tifinagh	371	R
R	2D80..2DDF	Ethiopic Extended	372	R
R	2DE0..2DFF	Cyrillic Extended-A	373	R
R	2E00 .. 2E16	☒ .. ☒		RIGHT ANGLE SUBSTITUTION MARKER ..
	DOTTED RIGHT-POINTING ANGLE	374	R	
R	2E17	☒ DOUBLE OBLIQUE HYPHEN	375	R
R	2E18 .. 2E19	☒ .. ☒		INVERTED INTERROBANG .. PALM BRANCH
	376 R			
R	2E1A	☒ HYPHEN WITH DIAERESIS	377	R
R	2E1B .. 2E1F	☒ .. ☒		TILDE WITH RING ABOVE .. TILDE WITH
	DOT BELOW	378 R		
R	2E20 .. 2E21	☒ .. ☒		LEFT VERTICAL BAR WITH QUILL .. RIGHT
	VERTICAL BAR WITH QUILL	379	R	
R	2E22 .. 2E25	☒ .. ☒		TOP LEFT HALF BRACKET .. BOTTOM RIGHT
	HALF BRACKET	380 R		
R	2E26 .. 2E29	☒ .. ☒		LEFT SIDEWAYS U BRACKET .. RIGHT
	DOUBLE PARENTHESIS	381 R		
R	2E2A .. 2E39	☒ .. ☒		TWO DOTS OVER ONE DOT PUNCTUATION ..
	TOP HALF SECTION SIGN	382 R		
R	2E3A	☒ TWO-EM DASH	383	R
R	2E3B	☒ THREE-EM DASH	384	R
R	2E3C .. 2E7F	☒ .. ☒		.. 385 R
U	2E80..2EFF	CJK Radicals Supplement	386	U
U	2F00..2FDF	Kangxi Radicals	387	U
U	2FE0 .. 2FEF	☒ .. ☒		.. 388 U

U	2FF0..2FFF		Ideographic Description Characters	389	U
U	3000		IDEOGRAPHIC SPACE	390	U
Tu	3001	、	IDEOGRAPHIC COMMA	391	Tu
Tu	3002	。	IDEOGRAPHIC FULL STOP	392	Tu
U	3003	”	DITTO MARK	393	U
U	3004	㊦	JAPANESE INDUSTRIAL STANDARD SYMBOL	394	U
U	3005	々	IDEOGRAPHIC ITERATION MARK	395	U
U	3006	↵	IDEOGRAPHIC CLOSING MARK	396	U
U	3007	○	IDEOGRAPHIC NUMBER ZERO	397	U
Tr	3008	<	LEFT ANGLE BRACKET	398	Tr
Tr	3009	>	RIGHT ANGLE BRACKET	399	Tr
Tr	300A	《	LEFT DOUBLE ANGLE BRACKET	400	Tr
Tr	300B	》	RIGHT DOUBLE ANGLE BRACKET	401	Tr
Tr	300C	┌	LEFT CORNER BRACKET	402	Tr
Tr	300D	┐	RIGHT CORNER BRACKET	403	Tr
Tr	300E	└	LEFT WHITE CORNER BRACKET	404	Tr
Tr	300F	┘	RIGHT WHITE CORNER BRACKET	405	Tr
Tr	3010	【	LEFT BLACK LENTICULAR BRACKET	406	Tr
Tr	3011	】	RIGHT BLACK LENTICULAR BRACKET	407	Tr
U	3012	〒	POSTAL MARK	408	U
U	3013	=	GETA MARK	409	U
Tr	3014	〔	LEFT TORTOISE SHELL BRACKET	410	Tr
Tr	3015	〕	RIGHT TORTOISE SHELL BRACKET	411	Tr
Tr	3016	〔	LEFT WHITE LENTICULAR BRACKET	412	Tr
Tr	3017	〕	RIGHT WHITE LENTICULAR BRACKET	413	Tr
Tr	3018	〔	LEFT WHITE TORTOISE SHELL BRACKET	414	Tr
Tr	3019	〕	RIGHT WHITE TORTOISE SHELL BRACKET	415	Tr
Tr	301A	〔	LEFT WHITE SQUARE BRACKET	416	Tr
Tr	301B	〕	RIGHT WHITE SQUARE BRACKET	417	Tr
Tr	301C	～	WAVE DASH	418	Tr
Tr	301D	“	REVERSED DOUBLE PRIME QUOTATION MARK	419	Tr
Tr	301E	”	DOUBLE PRIME QUOTATION MARK	420	Tr
Tr	301F	„	LOW DOUBLE PRIME QUOTATION MARK	421	Tr
U	3020	〒	POSTAL MARK FACE	422	U
U	3021	㊦	HANGZHOU NUMERAL ONE	423	U
U	3022	㊦	HANGZHOU NUMERAL TWO	424	U
U	3023	㊦	HANGZHOU NUMERAL THREE	425	U
U	3024	㊦	HANGZHOU NUMERAL FOUR	426	U
U	3025	㊦	HANGZHOU NUMERAL FIVE	427	U
U	3026	㊦	HANGZHOU NUMERAL SIX	428	U
U	3027	㊦	HANGZHOU NUMERAL SEVEN	429	U
U	3028	㊦	HANGZHOU NUMERAL EIGHT	430	U
U	3029	㊦	HANGZHOU NUMERAL NINE	431	U
U	302A	□	IDEOGRAPHIC LEVEL TONE MARK	432	U
U	302B	□	IDEOGRAPHIC RISING TONE MARK	433	U
U	302C	□	IDEOGRAPHIC DEPARTING TONE MARK	434	U
U	302D	□	IDEOGRAPHIC ENTERING TONE MARK	435	U
U	302E	□	HANGUL SINGLE DOT TONE MARK	436	U
U	302F	□	HANGUL DOUBLE DOT TONE MARK	437	U
Tr	3030	～	WAVY DASH	438	Tr
U	3031	<	VERTICAL KANA REPEAT MARK	439	U

U	3032	ㄱ	VERTICAL KANA REPEAT WITH VOICED SOUND MARK	440	U
U	3033	/	VERTICAL KANA REPEAT MARK UPPER HALF	441	U
U	3034	/ゝ	VERTICAL KANA REPEAT WITH VOICED SOUND MARK UPPER HALF	442	U
U	3035	\	VERTICAL KANA REPEAT MARK LOWER HALF	443	U
U	3036	㊦	CIRCLED POSTAL MARK	444	U
U	3037	XX	IDEOGRAPHIC TELEGRAPH LINE FEED SEPARATOR SYMBOL	445	U
U	3038	㊦	HANGZHOU NUMERAL TEN	446	U
U	3039	㊦	HANGZHOU NUMERAL TWENTY	447	U
U	303A	㊦	HANGZHOU NUMERAL THIRTY	448	U
U	303B	ㄷ	VERTICAL IDEOGRAPHIC ITERATION MARK	449	U
U	303C	㊦	MASU MARK	450	U
U	303D	ゝ	PART ALTERNATION MARK	451	U
U	303E	㊦	IDEOGRAPHIC VARIATION INDICATOR	452	U
U	303F	㊦	IDEOGRAPHIC HALF FILL SPACE	453	U
U	3040	㊦		454	U
Tu	3041	あ	HIRAGANA LETTER SMALL A	455	Tu
U	3042	あ	HIRAGANA LETTER A	456	U
Tu	3043	い	HIRAGANA LETTER SMALL I	457	Tu
U	3044	い	HIRAGANA LETTER I	458	U
Tu	3045	う	HIRAGANA LETTER SMALL U	459	Tu
U	3046	う	HIRAGANA LETTER U	460	U
Tu	3047	え	HIRAGANA LETTER SMALL E	461	Tu
U	3048	え	HIRAGANA LETTER E	462	U
Tu	3049	お	HIRAGANA LETTER SMALL O	463	Tu
U	304A	お	HIRAGANA LETTER O	464	U
U	304B	か	HIRAGANA LETTER KA	465	U
U	304C	が	HIRAGANA LETTER GA	466	U
U	304D	き	HIRAGANA LETTER KI	467	U
U	304E	ぎ	HIRAGANA LETTER GI	468	U
U	304F	く	HIRAGANA LETTER KU	469	U
U	3050	ぐ	HIRAGANA LETTER GU	470	U
U	3051	け	HIRAGANA LETTER KE	471	U
U	3052	げ	HIRAGANA LETTER GE	472	U
U	3053	こ	HIRAGANA LETTER KO	473	U
U	3054	ご	HIRAGANA LETTER GO	474	U
U	3055	さ	HIRAGANA LETTER SA	475	U
U	3056	ざ	HIRAGANA LETTER ZA	476	U
U	3057	し	HIRAGANA LETTER SI	477	U
U	3058	じ	HIRAGANA LETTER ZI	478	U
U	3059	す	HIRAGANA LETTER SU	479	U
U	305A	ず	HIRAGANA LETTER ZU	480	U
U	305B	せ	HIRAGANA LETTER SE	481	U
U	305C	ぜ	HIRAGANA LETTER ZE	482	U
U	305D	そ	HIRAGANA LETTER SO	483	U
U	305E	ぞ	HIRAGANA LETTER ZO	484	U
U	305F	た	HIRAGANA LETTER TA	485	U
U	3060	だ	HIRAGANA LETTER DA	486	U
U	3061	ち	HIRAGANA LETTER TI	487	U
U	3062	ぢ	HIRAGANA LETTER DI	488	U
Tu	3063	っ	HIRAGANA LETTER SMALL TU	489	Tu
U	3064	つ	HIRAGANA LETTER TU	490	U

U	3065	づ	HIRAGANA LETTER DU	491	U
U	3066	て	HIRAGANA LETTER TE	492	U
U	3067	で	HIRAGANA LETTER DE	493	U
U	3068	と	HIRAGANA LETTER TO	494	U
U	3069	ど	HIRAGANA LETTER DO	495	U
U	306A	な	HIRAGANA LETTER NA	496	U
U	306B	に	HIRAGANA LETTER NI	497	U
U	306C	ぬ	HIRAGANA LETTER NU	498	U
U	306D	ね	HIRAGANA LETTER NE	499	U
U	306E	の	HIRAGANA LETTER NO	500	U
U	306F	は	HIRAGANA LETTER HA	501	U
U	3070	ば	HIRAGANA LETTER BA	502	U
U	3071	ぱ	HIRAGANA LETTER PA	503	U
U	3072	ひ	HIRAGANA LETTER HI	504	U
U	3073	び	HIRAGANA LETTER BI	505	U
U	3074	ぴ	HIRAGANA LETTER PI	506	U
U	3075	ふ	HIRAGANA LETTER HU	507	U
U	3076	ぶ	HIRAGANA LETTER BU	508	U
U	3077	ぷ	HIRAGANA LETTER PU	509	U
U	3078	へ	HIRAGANA LETTER HE	510	U
U	3079	べ	HIRAGANA LETTER BE	511	U
U	307A	ぺ	HIRAGANA LETTER PE	512	U
U	307B	ほ	HIRAGANA LETTER HO	513	U
U	307C	ぼ	HIRAGANA LETTER BO	514	U
U	307D	ぽ	HIRAGANA LETTER PO	515	U
U	307E	ま	HIRAGANA LETTER MA	516	U
U	307F	み	HIRAGANA LETTER MI	517	U
U	3080	む	HIRAGANA LETTER MU	518	U
U	3081	め	HIRAGANA LETTER ME	519	U
U	3082	も	HIRAGANA LETTER MO	520	U
Tu	3083	ゃ	HIRAGANA LETTER SMALL YA	521	Tu
U	3084	や	HIRAGANA LETTER YA	522	U
Tu	3085	ゅ	HIRAGANA LETTER SMALL YU	523	Tu
U	3086	ゆ	HIRAGANA LETTER YU	524	U
Tu	3087	ょ	HIRAGANA LETTER SMALL YO	525	Tu
U	3088	よ	HIRAGANA LETTER YO	526	U
U	3089	ら	HIRAGANA LETTER RA	527	U
U	308A	り	HIRAGANA LETTER RI	528	U
U	308B	る	HIRAGANA LETTER RU	529	U
U	308C	れ	HIRAGANA LETTER RE	530	U
U	308D	ろ	HIRAGANA LETTER RO	531	U
Tu	308E	わ	HIRAGANA LETTER SMALL WA	532	Tu
U	308F	わ	HIRAGANA LETTER WA	533	U
U	3090	ゐ	HIRAGANA LETTER WI	534	U
U	3091	ゑ	HIRAGANA LETTER WE	535	U
U	3092	を	HIRAGANA LETTER WO	536	U
U	3093	ん	HIRAGANA LETTER N	537	U
U	3094	う	HIRAGANA LETTER VU	538	U
Tu	3095	か	HIRAGANA LETTER SMALL KA	539	Tu
Tu	3096	け	HIRAGANA LETTER SMALL KE	540	Tu
U	3097	☒		541	U

U	3098	☒		542	U
U	3099	゛	COMBINING KATAKANA-HIRAGANA VOICED SOUND MARK		543 U
U	309A	゜	COMBINING KATAKANA-HIRAGANA SEMI-VOICED SOUND MARK		544 U
Tu	309B	゛	KATAKANA-HIRAGANA VOICED SOUND MARK	545	Tu
Tu	309C	゜	KATAKANA-HIRAGANA SEMI-VOICED SOUND MARK	546	Tu
Tu	309D	ゝ	HIRAGANA ITERATION MARK	547	Tu
Tu	309E	ゞ	HIRAGANA VOICED ITERATION MARK	548	Tu
U	309F	ㇿ	HIRAGANA DIGRAPH YORI	549	U
Tr	30A0	=	KATAKANA-HIRAGANA DOUBLE HYPHEN	550	Tr
Tu	30A1	ア	KATAKANA LETTER SMALL A	551	Tu
U	30A2	ア	KATAKANA LETTER A	552	U
Tu	30A3	イ	KATAKANA LETTER SMALL I	553	Tu
U	30A4	イ	KATAKANA LETTER I	554	U
Tu	30A5	ウ	KATAKANA LETTER SMALL U	555	Tu
U	30A6	ウ	KATAKANA LETTER U	556	U
Tu	30A7	エ	KATAKANA LETTER SMALL E	557	Tu
U	30A8	エ	KATAKANA LETTER E	558	U
Tu	30A9	オ	KATAKANA LETTER SMALL O	559	Tu
U	30AA	オ	KATAKANA LETTER O	560	U
U	30AB	カ	KATAKANA LETTER KA	561	U
U	30AC	ガ	KATAKANA LETTER GA	562	U
U	30AD	キ	KATAKANA LETTER KI	563	U
U	30AE	ギ	KATAKANA LETTER GI	564	U
U	30AF	ク	KATAKANA LETTER KU	565	U
U	30B0	グ	KATAKANA LETTER GU	566	U
U	30B1	ケ	KATAKANA LETTER KE	567	U
U	30B2	ゲ	KATAKANA LETTER GE	568	U
U	30B3	コ	KATAKANA LETTER KO	569	U
U	30B4	ゴ	KATAKANA LETTER GO	570	U
U	30B5	サ	KATAKANA LETTER SA	571	U
U	30B6	ザ	KATAKANA LETTER ZA	572	U
U	30B7	シ	KATAKANA LETTER SI	573	U
U	30B8	ジ	KATAKANA LETTER ZI	574	U
U	30B9	ス	KATAKANA LETTER SU	575	U
U	30BA	ズ	KATAKANA LETTER ZU	576	U
U	30BB	セ	KATAKANA LETTER SE	577	U
U	30BC	ゼ	KATAKANA LETTER ZE	578	U
U	30BD	ソ	KATAKANA LETTER SO	579	U
U	30BE	ゾ	KATAKANA LETTER ZO	580	U
U	30BF	タ	KATAKANA LETTER TA	581	U
U	30C0	ダ	KATAKANA LETTER DA	582	U
U	30C1	チ	KATAKANA LETTER TI	583	U
U	30C2	ヂ	KATAKANA LETTER DI	584	U
Tu	30C3	ッ	KATAKANA LETTER SMALL TU	585	Tu
U	30C4	ツ	KATAKANA LETTER TU	586	U
U	30C5	ヅ	KATAKANA LETTER DU	587	U
U	30C6	テ	KATAKANA LETTER TE	588	U
U	30C7	デ	KATAKANA LETTER DE	589	U
U	30C8	ト	KATAKANA LETTER TO	590	U
U	30C9	ド	KATAKANA LETTER DO	591	U
U	30CA	ナ	KATAKANA LETTER NA	592	U

U	30CB	ニ	KATAKANA LETTER NI	593	U
U	30CC	ヌ	KATAKANA LETTER NU	594	U
U	30CD	ネ	KATAKANA LETTER NE	595	U
U	30CE	ノ	KATAKANA LETTER NO	596	U
U	30CF	ハ	KATAKANA LETTER HA	597	U
U	30D0	バ	KATAKANA LETTER BA	598	U
U	30D1	パ	KATAKANA LETTER PA	599	U
U	30D2	ヒ	KATAKANA LETTER HI	600	U
U	30D3	ビ	KATAKANA LETTER BI	601	U
U	30D4	ピ	KATAKANA LETTER PI	602	U
U	30D5	フ	KATAKANA LETTER HU	603	U
U	30D6	ブ	KATAKANA LETTER BU	604	U
U	30D7	プ	KATAKANA LETTER PU	605	U
U	30D8	ヘ	KATAKANA LETTER HE	606	U
U	30D9	ベ	KATAKANA LETTER BE	607	U
U	30DA	ペ	KATAKANA LETTER PE	608	U
U	30DB	ホ	KATAKANA LETTER HO	609	U
U	30DC	ボ	KATAKANA LETTER BO	610	U
U	30DD	ポ	KATAKANA LETTER PO	611	U
U	30DE	マ	KATAKANA LETTER MA	612	U
U	30DF	ミ	KATAKANA LETTER MI	613	U
U	30E0	ム	KATAKANA LETTER MU	614	U
U	30E1	メ	KATAKANA LETTER ME	615	U
U	30E2	モ	KATAKANA LETTER MO	616	U
Tu	30E3	ヤ	KATAKANA LETTER SMALL YA	617	Tu
U	30E4	ヤ	KATAKANA LETTER YA	618	U
Tu	30E5	ユ	KATAKANA LETTER SMALL YU	619	Tu
U	30E6	ユ	KATAKANA LETTER YU	620	U
Tu	30E7	ヨ	KATAKANA LETTER SMALL YO	621	Tu
U	30E8	ヨ	KATAKANA LETTER YO	622	U
U	30E9	ラ	KATAKANA LETTER RA	623	U
U	30EA	リ	KATAKANA LETTER RI	624	U
U	30EB	ル	KATAKANA LETTER RU	625	U
U	30EC	レ	KATAKANA LETTER RE	626	U
U	30ED	ロ	KATAKANA LETTER RO	627	U
Tu	30EE	ワ	KATAKANA LETTER SMALL WA	628	Tu
U	30EF	ワ	KATAKANA LETTER WA	629	U
U	30F0	ヰ	KATAKANA LETTER WI	630	U
U	30F1	ヱ	KATAKANA LETTER WE	631	U
U	30F2	ヲ	KATAKANA LETTER WO	632	U
U	30F3	ン	KATAKANA LETTER N	633	U
U	30F4	ヴ	KATAKANA LETTER VU	634	U
Tu	30F5	カ	KATAKANA LETTER SMALL KA	635	Tu
Tu	30F6	ケ	KATAKANA LETTER SMALL KE	636	Tu
U	30F7	ヴ	KATAKANA LETTER VA	637	U
U	30F8	ヰ	KATAKANA LETTER VI	638	U
U	30F9	ヱ	KATAKANA LETTER VE	639	U
U	30FA	ヲ	KATAKANA LETTER VO	640	U
U	30FB	・	KATAKANA MIDDLE DOT	641	U
Tr	30FC	ー	KATAKANA-HIRAGANA PROLONGED SOUND MARK	642	Tr
U	30FD	ヽ	KATAKANA ITERATION MARK	643	U

U	30FE	ゝ	KATAKANA VOICED ITERATION MARK	644	U
U	30FF	ㇿ	KATAKANA DIGRAPH KOTO	645	U
U	3100..312F		Bopomofo	646	U
U	3130..318F		Hangul Compatibility Jamo	647	U
U	3190..319F		Kanbun	648	U
U	31A0..31BF		Bopomofo Extended	649	U
U	31C0..31EF		CJK Strokes	650	U
Tu	31F0..31FF		Katakana Phonetic Extensions	651	Tu
U	3200 .. 321E	☒ .. ☒		PARENTHESIZED HANGUL KIYEOK ..	
	PARENTHESIZED KOREAN CHARACTER O HU			652	U
U	321F .. 32FF	☒ .. ☒		..	653 U
Tu	3300 .. 3357	ㇿ .. ㇿ		SQUARE APAATO .. SQUARE WATTO	
654	Tu				
U	3358 .. 337A	ㇿ .. ☒		IDEOGRAPHIC TELEGRAPH SYMBOL FOR HOUR	
	ZERO .. SQUARE IU	655	U		
Tu	337B .. 337F	ㇿ .. ㇿ		SQUARE ERA NAME HEISEI .. SQUARE	
	CORPORATION	656	Tu		
U	3380 .. 33FF	pA .. ☒		SQUARE PA AMPS .. SQUARE GAL	
657	U				
U	3400..4DBF		CJK Unified Ideographs Extension A	658	U
U	4DC0..4DFF		Yijing Hexagram Symbols	659	U
U	4E00..9FFF		CJK Unified Ideographs	660	U
U	A000..A48F		Yi Syllables	661	U
U	A490..A4CF		Yi Radicals	662	U
R	A4D0..A4FF		Lisu	663	R
R	A500..A63F		Vai	664	R
R	A640..A69F		Cyrillic Extended-B	665	R
R	A6A0..A6FF		Bamum	666	R
R	A700..A71F		Modifier Tone Letters	667	R
R	A720..A7FF		Latin Extended-D	668	R
R	A800..A82F		Syloti Nagri	669	R
R	A830..A83F		Common Indic Number Forms	670	R
R	A840..A87F		Phags-pa	671	U * Modified by Taro
R	A880..A8DF		Saurashtra	672	R
R	A8E0..A8FF		Devanagari Extended	673	R
R	A900..A92F		Kayah Li	674	R
R	A930..A95F		Rejang	675	R
U	A960..A97F		Hangul Jamo Extended-A	676	U
R	A980..A9DF		Javanese	677	R
R	A9E0 .. A9FF	☒ .. ☒		..	678 R
R	AA00..AA5F		Cham	679	R
R	AA60..AA7F		Myanmar Extended-A	680	R
R	AA80..AADF		Tai Viet	681	R
R	AAE0..AAFF		Meetei Mayek Extensions	682	R
R	AB00..AB2F		Ethiopic Extended-A	683	R
R	AB30 .. ABBF	☒ .. ☒		..	684 R
R	ABC0..ABFF		Meetei Mayek	685	R
U	AC00..D7AF		Hangul Syllables	686	U
U	D7B0..D7FF		Hangul Jamo Extended-B	687	U
R	D800 .. DFFF		..	688	R
U	E000..F8FF		Private Use Area	689	U

U	F900..FAFF		CJK Compatibility Ideographs	690	U	
R	FB00..FB4F		Alphabetic Presentation Forms	691	R	
R	FB50..FDFD		Arabic Presentation Forms-A	692	R	
R	FE00..FE0F		Variation Selectors	693	R	
U	FE10	,	PRESENTATION FORM FOR VERTICAL COMMA	694	U	
U	FE11	、	PRESENTATION FORM FOR VERTICAL IDEOGRAPHIC COMMA	695	U	
U	FE12	。°	PRESENTATION FORM FOR VERTICAL IDEOGRAPHIC FULL STOP	696	U	
U	FE13	⊠	PRESENTATION FORM FOR VERTICAL COLON	697	U	
U	FE14	⊠	PRESENTATION FORM FOR VERTICAL SEMICOLON	698	U	
U	FE15	⊠	PRESENTATION FORM FOR VERTICAL EXCLAMATION MARK	699	U	
U	FE16	⊠	PRESENTATION FORM FOR VERTICAL QUESTION MARK	700	U	
U	FE17	⊠	PRESENTATION FORM FOR VERTICAL LEFT WHITE LENTICULAR BRACKET	701	U	
U	FE18	⊠	PRESENTATION FORM FOR VERTICAL RIGHT WHITE LENTICULAR BRACKET	702	U	2
U						
U	FE19	:	PRESENTATION FORM FOR VERTICAL HORIZONTAL ELLIPSIS	703	U	
U	FE1A	⊠		704	U	
U	FE1B	⊠		705	U	
U	FE1C	⊠		706	U	
U	FE1D	⊠		707	U	
U	FE1E	⊠		708	U	
U	FE1F	⊠		709	U	
R	FE20..FE2F		Combining Half Marks	710	R	
U	FE30	:	PRESENTATION FORM FOR VERTICAL TWO DOT LEADER	711	U	
U	FE31	|	PRESENTATION FORM FOR VERTICAL EM DASH	712	U	
U	FE32	·	PRESENTATION FORM FOR VERTICAL EN DASH	713	U	
U	FE33	|	PRESENTATION FORM FOR VERTICAL LOW LINE	714	U	
U	FE34	⊠	PRESENTATION FORM FOR VERTICAL WAVY LOW LINE	715	U	
U	FE35	(	PRESENTATION FORM FOR VERTICAL LEFT PARENTHESIS	716	U	
U	FE36	)	PRESENTATION FORM FOR VERTICAL RIGHT PARENTHESIS	717	U	
U	FE37	{	PRESENTATION FORM FOR VERTICAL LEFT CURLY BRACKET	718	U	
U	FE38	}	PRESENTATION FORM FOR VERTICAL RIGHT CURLY BRACKET	719	U	
U	FE39	[	PRESENTATION FORM FOR VERTICAL LEFT TORTOISE SHELL BRACKET	720	U	
U	FE3A	]	PRESENTATION FORM FOR VERTICAL RIGHT TORTOISE SHELL BRACKET	721	U	
U	FE3B	⌈	PRESENTATION FORM FOR VERTICAL LEFT BLACK LENTICULAR BRACKET	722	U	
U	FE3C	⌋	PRESENTATION FORM FOR VERTICAL RIGHT BLACK LENTICULAR BRACKET	723	U	2
U						
U	FE3D	⌞	PRESENTATION FORM FOR VERTICAL LEFT DOUBLE ANGLE BRACKET	724	U	
U	FE3E	⌟	PRESENTATION FORM FOR VERTICAL RIGHT DOUBLE ANGLE BRACKET	725	U	
U	FE3F	⌵	PRESENTATION FORM FOR VERTICAL LEFT ANGLE BRACKET	726	U	
U	FE40	⌶	PRESENTATION FORM FOR VERTICAL RIGHT ANGLE BRACKET	727	U	
U	FE41	┌	PRESENTATION FORM FOR VERTICAL LEFT CORNER BRACKET	728	U	
U	FE42	┐	PRESENTATION FORM FOR VERTICAL RIGHT CORNER BRACKET	729	U	
U	FE43	┌	PRESENTATION FORM FOR VERTICAL LEFT WHITE CORNER BRACKET	730	U	
U	FE44	┐	PRESENTATION FORM FOR VERTICAL RIGHT WHITE CORNER BRACKET	731	U	
U	FE45	◌	SESAME DOT	732	U	
U	FE46	◌	WHITE SESAME DOT	733	U	
U	FE47	⌈	PRESENTATION FORM FOR VERTICAL LEFT SQUARE BRACKET	734	U	
U	FE48	⌋	PRESENTATION FORM FOR VERTICAL RIGHT SQUARE BRACKET	735	U	
U	FE49	⊠	DASHED OVERLINE	736	R	
U	FE4A	⊠	CENTRELINE OVERLINE	737	R	
U	FE4B	⊠	WAVY OVERLINE	738	R	

U	FE4C	☒	DOUBLE WAVY OVERLINE	739	R
U	FE4D	☒	DASHED LOW LINE	740	R
U	FE4E	☒	CENTRELINE LOW LINE	741	R
U	FE4F	☒	WAVY LOW LINE	742	R
U	FE50	,	SMALL COMMA	743	Tu
U	FE51	、	SMALL IDEOGRAPHIC COMMA	744	Tu
U	FE52	.	SMALL FULL STOP	745	Tu
U	FE53	☒		746	
U	FE54	;	SMALL SEMICOLON	747	R
U	FE55	:	SMALL COLON	748	R
U	FE56	?	SMALL QUESTION MARK	749	R
U	FE57	!	SMALL EXCLAMATION MARK	750	R
U	FE58	—	SMALL EM DASH	751	R
R	FE59	(	SMALL LEFT PARENTHESIS	752	Tr
R	FE5A	)	SMALL RIGHT PARENTHESIS	753	Tr
R	FE5B	{	SMALL LEFT CURLY BRACKET	754	Tr
R	FE5C	}	SMALL RIGHT CURLY BRACKET	755	Tr
R	FE5D	[	SMALL LEFT TORTOISE SHELL BRACKET	756	Tr
R	FE5E	]	SMALL RIGHT TORTOISE SHELL BRACKET	757	Tr
U	FE5F	#	SMALL NUMBER SIGN	758	R
U	FE60	&	SMALL AMPERSAND	759	R
U	FE61	*	SMALL ASTERISK	760	R
U	FE62	+	SMALL PLUS SIGN	761	R
U	FE63	-	SMALL HYPHEN-MINUS	762	R
U	FE64	<	SMALL LESS-THAN SIGN	763	R
U	FE65	>	SMALL GREATER-THAN SIGN	764	R
U	FE66	=	SMALL EQUALS SIGN	765	R
U	FE67	☒		766	
U	FE68	\	SMALL REVERSE SOLIDUS	767	R
U	FE69	\$	SMALL DOLLAR SIGN	768	R
U	FE6A	%	SMALL PERCENT SIGN	769	R
U	FE6B	@	SMALL COMMERCIAL AT	770	R
U	FE6C .. FE6F	☒ .. ☒		..	771 U
R	FE70..FEFF		Arabic Presentation Forms-B	772	R
R	FF00	☒		773	R
Tu	FF01	!	FULLWIDTH EXCLAMATION MARK	774	Tu
U	FF02	"	FULLWIDTH QUOTATION MARK	775	U
U	FF03	#	FULLWIDTH NUMBER SIGN	776	U
U	FF04	\$	FULLWIDTH DOLLAR SIGN	777	U
U	FF05	%	FULLWIDTH PERCENT SIGN	778	U
U	FF06	&	FULLWIDTH AMPERSAND	779	U
U	FF07	'	FULLWIDTH APOSTROPHE	780	U
Tr	FF08	(	FULLWIDTH LEFT PARENTHESIS	781	Tr
Tr	FF09	)	FULLWIDTH RIGHT PARENTHESIS	782	Tr
U	FF0A	*	FULLWIDTH ASTERISK	783	U
U	FF0B	+	FULLWIDTH PLUS SIGN	784	U
Tu	FF0C	,	FULLWIDTH COMMA	785	Tu
Tr	FF0D	—	FULLWIDTH HYPHEN-MINUS	786	R
Tu	FF0E	.	FULLWIDTH FULL STOP	787	Tu
U	FF0F	/	FULLWIDTH SOLIDUS	788	U
U	FF10	0	FULLWIDTH DIGIT ZERO	789	U

U	FF11	1	FULLWIDTH DIGIT ONE	790	U
U	FF12	2	FULLWIDTH DIGIT TWO	791	U
U	FF13	3	FULLWIDTH DIGIT THREE	792	U
U	FF14	4	FULLWIDTH DIGIT FOUR	793	U
U	FF15	5	FULLWIDTH DIGIT FIVE	794	U
U	FF16	6	FULLWIDTH DIGIT SIX	795	U
U	FF17	7	FULLWIDTH DIGIT SEVEN	796	U
U	FF18	8	FULLWIDTH DIGIT EIGHT	797	U
U	FF19	9	FULLWIDTH DIGIT NINE	798	U
Tr	FF1A	:	FULLWIDTH COLON	799	Tr
Tr	FF1B	;	FULLWIDTH SEMICOLON	800	Tr
Tr	FF1C	<	FULLWIDTH LESS-THAN SIGN	801	R
Tr	FF1D	=	FULLWIDTH EQUALS SIGN	802	R
Tr	FF1E	>	FULLWIDTH GREATER-THAN SIGN	803	R
U	FF1F	?	FULLWIDTH QUESTION MARK	804	U
U	FF20	@	FULLWIDTH COMMERCIAL AT	805	U
U	FF21 .. FF3A	A .. Z	FULLWIDTH LATIN CAPITAL LETTER A ..		
			FULLWIDTH LATIN CAPITAL LETTER Z	806	U
Tr	FF3B	[	FULLWIDTH LEFT SQUARE BRACKET	807	Tr
U	FF3C	\	FULLWIDTH REVERSE SOLIDUS	808	U
Tr	FF3D	]	FULLWIDTH RIGHT SQUARE BRACKET	809	Tr
U	FF3E	^	FULLWIDTH CIRCUMFLEX ACCENT	810	U
Tr	FF3F	—	FULLWIDTH LOW LINE	811	Tr
U	FF40	`	FULLWIDTH GRAVE ACCENT	812	U
U	FF41 .. FF5A	a .. z	FULLWIDTH LATIN SMALL LETTER A ..		
			FULLWIDTH LATIN SMALL LETTER Z	813	U
Tr	FF5B	{	FULLWIDTH LEFT CURLY BRACKET	814	Tr
Tr	FF5C	|	FULLWIDTH VERTICAL LINE	815	Tr
Tr	FF5D	}	FULLWIDTH RIGHT CURLY BRACKET	816	Tr
Tr	FF5E	~	FULLWIDTH TILDE	817	Tr
Tr	FF5F	⸀	FULLWIDTH LEFT WHITE PARENTHESIS	818	Tr
Tr	FF60	⸁	FULLWIDTH RIGHT WHITE PARENTHESIS	819	Tr
Tu	FF61	。	HALFWIDTH IDEOGRAPHIC FULL STOP	820	R
Tr	FF62	┌	HALFWIDTH LEFT CORNER BRACKET	821	R
Tr	FF63	┐	HALFWIDTH RIGHT CORNER BRACKET	822	R
Tu	FF64	、	HALFWIDTH IDEOGRAPHIC COMMA	823	R
U	FF65	・	HALFWIDTH KATAKANA MIDDLE DOT	824	R
U	FF66	ヲ	HALFWIDTH KATAKANA LETTER WO	825	R
Tu	FF67	ァ	HALFWIDTH KATAKANA LETTER SMALL A	826	R
Tu	FF68	ィ	HALFWIDTH KATAKANA LETTER SMALL I	827	R
Tu	FF69	ゥ	HALFWIDTH KATAKANA LETTER SMALL U	828	R
Tu	FF6A	ェ	HALFWIDTH KATAKANA LETTER SMALL E	829	R
Tu	FF6B	ォ	HALFWIDTH KATAKANA LETTER SMALL O	830	R
Tu	FF6C	ャ	HALFWIDTH KATAKANA LETTER SMALL YA	831	R
Tu	FF6D	ュ	HALFWIDTH KATAKANA LETTER SMALL YU	832	R
Tu	FF6E	ョ	HALFWIDTH KATAKANA LETTER SMALL YO	833	R
Tu	FF6F	ッ	HALFWIDTH KATAKANA LETTER SMALL TU	834	R
Tr	FF70	ー	HALFWIDTH KATAKANA-HIRAGANA PROLONGED SOUND MARK	835	R
U	FF71 .. FF9F	ァ .. ン	HALFWIDTH KATAKANA LETTER A ..		
			HALFWIDTH KATAKANA SEMI-VOICED SOUND MARK	836	R
U	FFA0 .. FFDF	㊦ .. ㊿	HALFWIDTH HANGUL FILLER ..	837	

R					
U	FFE0	€	FULLWIDTH CENT SIGN	838	U
U	FFE1	£	FULLWIDTH POUND SIGN	839	U
U	FFE2	¬	FULLWIDTH NOT SIGN	840	U
Tr	FFE3	—	FULLWIDTH MACRON	841	Tr
U	FFE4	‡	FULLWIDTH BROKEN BAR	842	U
U	FFE5	¥	FULLWIDTH YEN SIGN	843	U
U	FFE6	₩	FULLWIDTH WON SIGN	844	U
U	FFE7	☒		845	
U	FFE8	|	HALFWIDTH FORMS LIGHT VERTICAL	846	R
U	FFE9	←	HALFWIDTH LEFTWARDS ARROW	847	R
U	FFEA	↑	HALFWIDTH UPWARDS ARROW	848	R
U	FFEB	→	HALFWIDTH RIGHTWARDS ARROW	849	R
U	FFEC	↓	HALFWIDTH DOWNWARDS ARROW	850	R
U	FFED	■	HALFWIDTH BLACK SQUARE	851	R
U	FFEE	○	HALFWIDTH WHITE CIRCLE	852	R
U	FFEF	☒		853	
U	FFF0	☒		854	
U	FFF1	☒		855	
U	FFF2	☒		856	
U	FFF3	☒		857	
U	FFF4	☒		858	
U	FFF5	☒		859	
U	FFF6	☒		860	
U	FFF7	☒		861	
U	FFF8	☒		862	
R	FFF9 .. FFFB	☒ .. ☒	INTERLINEAR ANNOTATION ANCHOR ..		
	INTERLINEAR ANNOTATION TERMINATOR			863	R
U	FFFD	□	REPLACEMENT CHARACTER	864	
R	FFFE			865	R
R	FFFF			866	R
R	10000..1007F		Linear B Syllabary	867	R
R	10080..100FF		Linear B Ideograms	868	R
R	10100..1013F		Aegean Numbers	869	R
R	10140..1018F		Ancient Greek Numbers	870	R
R	10190..101CF		Ancient Symbols	871	R
R	101D0..101FF		Phaistos Disc	872	R
R	10280..1029F		Lycian	873	R
R	102A0..102DF		Carian	874	R
R	10300..1032F		Old Italic	875	R
R	10330..1034F		Gothic	876	R
R	10380..1039F		Ugaritic	877	R
R	103A0..103DF		Old Persian	878	R
R	10400..1044F		Deseret	879	R
R	10450..1047F		Shavian	880	R
R	10480..104AF		Osmanya	881	R
R	10800..1083F		Cypriot Syllabary	882	R
R	10840..1085F		Imperial Aramaic	883	R
R	10900..1091F		Phoenician	884	R
R	10920..1093F		Lydian	885	R
R	10980..1099F		Meroitic Hieroglyphs	886	R

R	109A0..109FF		Meroitic Cursive	887	R
R	10A00..10A5F		Kharoshthi	888	R
R	10A60..10A7F		Old South Arabian	889	R
R	10B00..10B3F		Avestan	890	R
R	10B40..10B5F		Inscriptional Parthian	891	R
R	10B60..10B7F		Inscriptional Pahlavi	892	R
R	10C00..10C4F		Old Turkic	893	R
R	10E60..10E7F		Rumi Numeral Symbols	894	R
R	11000..1107F		Brahmi	895	R
R	11080..110CF		Kaithi	896	R
R	110D0..110FF		Sora Sompeng	897	R
R	11100..1114F		Chakma	898	R
R	11180..111DF		Sharada	899	R
R	11680..116CF		Takri	900	R
R	12000..123FF		Cuneiform	901	R
R	12400..1247F		Cuneiform Numbers and Punctuation	902	R
U	13000..1342F		Egyptian Hieroglyphs	903	U
R	16800..16A3F		Bamum Supplement	904	R
R	16F00..16F9F		Miao	905	R
U	1B000..1B0FF		Kana Supplement	906	U
U	1D000..1D0FF		Byzantine Musical Symbols	907	R
U	1D100..1D1FF		Musical Symbols	908	R
U	1D200..1D24F		Ancient Greek Musical Notation	909	R
U	1D300..1D35F		Tai Xuan Jing Symbols	910	U
U	1D360..1D37F		Counting Rod Numerals	911	U
R	1D400..1D7FF		Mathematical Alphanumeric Symbols	912	R
R	1EE00..1EEFF		Arabic Mathematical Alphabetic Symbols	913	R
U	1F000..1F02F		Mahjong Tiles	914	U
U	1F030..1F09F		Domino Tiles	915	U
U	1F0A0..1F0FF		Playing Cards	916	U
U	1F100..1F1FF		Enclosed Alphanumeric Supplement	917	U
Tu	1F200	<input checked="" type="checkbox"/>	SQUARE HIRAGANA HOKA	918	Tu
Tu	1F201	<input checked="" type="checkbox"/>	SQUARED KATAKANA KOKO	919	Tu
U	1F202 .. 1F2FF	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>	SQUARED KATAKANA SA ..	9 2 0	
U					
U	1F300..1F5FF		Miscellaneous Symbols And Pictographs	921	U
U	1F600..1F64F		Emoticons	922	U
U	1F680..1F6FF		Transport And Map Symbols	923	U
U	1F700..1F77F		Alchemical Symbols	924	U
U	20000..2A6DF		CJK Unified Ideographs Extension B	925	U
U	2A6E0 .. 2A6FF	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		..	926
U	2A700..2B73F		CJK Unified Ideographs Extension C	927	U
U	2B740..2B81F		CJK Unified Ideographs Extension D	928	U
U	2B820 .. 2F7FF	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		..	929
U	2F800..2FA1F		CJK Compatibility Ideographs Supplement	930	U
U	2FA20 .. 2FFFD	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		..	931
U	30000 .. 3FFFD	<input checked="" type="checkbox"/> .. <input checked="" type="checkbox"/>		..	932
R	E0100 .. E01EF	<input type="checkbox"/> .. <input type="checkbox"/>	VARIATION SELECTOR-17 .. VARIATION		
	SELECTOR-256		933 R		
U	2190..21FF	←	Arrows	9001	R Taro added this entry
	(2012/06/28)				

REMARK: 2012/06/28 Version 1.1.1 (DRAFT STATE)
REMARK: 2012/06/30 Version 1.1.2 (DRAFT STATE)
REMARK: 2012/07/01 Version 1.1.3 (DRAFT STATE)

In this table, Mongolian (U+1800 - U+18AF) and Phags-pa (U+A840 - U+A87F) are defined to be UPRIGHT, based on the standard posture of the characters listed in the Unicode 6.1 Character Code Charts. But, we should pay attention to the fact that it is known that glyphs in Mongolian and Phags-pa fonts are usually +90 degrees pre-rotated in the horizontal writing mode, so that they will be displayed in the UPRIGHT posture when rotated -90 degrees in the vertical writing mode.

REMARK: 2012/07/01 Version 1.1.4 (DRAFT STATE)

Shinyu Murakami kindly informed me that he found instances of the orientation Tr in the original version were incorrectly changed to Tu, and also two instances of the incorrect orientation identifier "U5" were found in all the versions up to 1.1.3. Also, he pointed out some errors that seemed to be due to some problem in the author's style setting for the Excel fields in the intermediate files. The author corrected these two errors in the version 1.1.4.

REMARK: 2012/07/02 Version 1.1.5 (DRAFT STATE)

As suggested by Shinyu Murakami, the decision made at the conference on June 7, 2012 needed to be reflected on this document.

REMARK: 2012/07/12 Version 1.1.6 (DRAFT STATE)

Based on inputs from Shinyu Murakami and Fantasai, the orientation of the following ranges of characters are modified to U: U+2116, U+2139, U+213A and U+230C...U+231F.