

Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Organisation Internationale de Normalisation
Международная организация по стандартизации

Doc Type: Working Group Document**Title: Preliminary proposal for encoding the Kpelle script in the SMP of the UCS****Source: UC Berkeley Script Encoding Initiative (Universal Scripts Project)****Authors: Michael Everson and Charles Riley****Status: Individual Contribution****Action: For consideration by JTC1/SC2/WG2 and UTC****Date: 2010-02-23**

1. Introduction. A syllabic script for the Kpelle language was devised in the 1930's by Gbili, a chief of Sanoyea, in Bong County, Liberia, during the 1930's. Accounts usually mention that Gbili was inspired by revelation in a dream. In one retelling, Gbili dictated the script in nearly complete form to Lee-Polu-Mala-Yale, from the village of Zongkai. The script was actively used for a few decades after its invention, by other chiefs, including Bono-Boi of Yanekwele, their scribes, and by one of the wives of Gbili, Neni- Tee. Uses included sending messages, keeping tax and store records, recording legal debts, and compiling a recipe book. (Stone 1990:136-137; Dalby 1967:30, f.n. 2). It has not been determined how many of these texts may have survived the Liberian civil wars, but probably very little if any original material remains.

The first scholarly reference to the Kpelle script comes from Johannes Friedrich (1937), who offered little in the way of accompanying detail. A first attempt at analysis came through with Lassort (1951), who included data from two sources, collected separately in the field. David Dalby published an analysis in 1967 based on the Lassort data, and Ruth Stone (1990) has produced a more recent article, using her own field research, the collection of which dates from 1970. The use of the script has been light, but continued at least through the 1980's among the Kpelle.

2. Structure. One of the unique features of the Kpelle syllabary is that it encodes for pairs of syllables, what Dalby terms "mutational pairs", that are related by the phonological similarity of their initial consonants; thus reducing the total number of characters encoded by about half of what it would be otherwise. In this proposal, only one character has been proposed for these mutational pairs for example, 16C02 KPI-GBI is used for both *kpi* and *gbi*.

Sometimes, however, a mutational pair has two glyphs available for use interchangeably. Thus, for the pair of related syllables *ka* and *ga*, either 𐀓 KA-GA or 𐀔 GA-KA may be used, and for the pair of related syllables *ka* and *ga*, either 𐀕 TI-DI or 𐀖 DI-TI may be used. Lassort's data is presented as two full sets of glyphs across the range of characters, and his data is largely repeated in the Dalby source in a compiled tabular form that attempts to unify the two Lassort sources. Comparing the data presented in Lassort and Stone, there are small sets of characters found in one but not the other. The most notable of these are the Kpelle digits, which Stone notes, "were added later also. The late Peter Giddings, a young boy at the time of the script's invention, recalled how he returned to Sanoyea during a school vacation, to be shown the script. Peter said that he pointed out the absence of characters for numbers to Gbili. He then helped him devise a system, which supplemented the original characters of the script." (Stone 1990:139). Most series of syllables can be traced cleanly through from Lassort to Stone.

Dalby’s chart shows a number of glyph variants. It is likely that these should be treated as Vai and Bamum glyph variants have been: that if they are required, either a dedicated font for them should be used, or OpenType tables to invoke alternate forms. The forms used in the chart are the primary ones given in Dalby.

3. Collating order. Collation order is as in the code chart. Lassort’s method of collation loosely follows a Latin-based sort, using the initial consonant of transliterated syllables as the primary key to the collation, with the ending vowels of the syllable serving to provide the secondary collation weight. Dalby and Stone both opt for a tabular presentation of the data, ordered nearly identically to each other, following Welmers (1973), with the initial consonants beginning each row in their associated pairs—p/b, b/m̄, kp/gb, f/v, t/d, l/n, h(s)/j(z), y/ny, k/g, kw/gw, ʋ(/ɲ), ɥ or w, w(/ɲw)—followed by nasal syllables and the syllable lengthening characters ω M, \mathfrak{H} Y-NY, and \mathfrak{G} NG.

4. Character names. The usual UCS conventions are used, with BH representing *b*, B representing *ḃ*, EE representing *e*, E representing *ɛ*, OO representing *o*, O representing *ɔ*, and NG representing *ŋ*. Nasalized consonants are written with a final -N.

5. Linebreaking. Letters behave as in Vai and Bamum.

6. Punctuation and digits. To date, no script-specific punctuation has been seen. Characters exist for the numbers one through ten; no zero has yet been attested.

7. Unicode Character Properties.

```
16C00;KPELLE SYLLABLE PI-BHI;Lo;0;L; ; ; ; ;N; ; ; ;
..
16C69;KPELLE SYLLABLE NG;Lo;0;L; ; ; ; ;N; ; ; ;
16C71;KPELLE DIGIT ONE;Nd;0;L; ;1;1;1;N; ; ; ;
16C72;KPELLE DIGIT TWO;Nd;0;L; ;2;2;2;N; ; ; ;
16C73;KPELLE DIGIT THREE;Nd;0;L; ;3;3;3;N; ; ; ;
16C74;KPELLE DIGIT FOUR;Nd;0;L; ;4;4;4;N; ; ; ;
16C75;KPELLE DIGIT FIVE;Nd;0;L; ;5;5;5;N; ; ; ;
16C76;KPELLE DIGIT SIX;Nd;0;L; ;6;6;6;N; ; ; ;
16C77;KPELLE DIGIT SEVEN;Nd;0;L; ;7;7;7;N; ; ; ;
16C78;KPELLE DIGIT EIGHT;Nd;0;L; ;8;8;8;N; ; ; ;
16C79;KPELLE DIGIT NINE;Nd;0;L; ;9;9;9;N; ; ; ;
16C7A;KPELLE NUMBER TEN;No;0;L; ; ; ;10;N; ; ; ;
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8. Acknowledgements. This project was made possible in part by a grant from the U.S. National Endowment for the Humanities, which funded the Universal Scripts Project (part of the Script Encoding Initiative at UC Berkeley) in respect of the Kpelle encoding. Any views, findings, conclusions or recommendations expressed in this publication do not necessarily reflect those of the National Endowment of the Humanities.

9. Bibliography

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	16C0	16C1	16C2	16C3	16C4	16C5	16C6	16C7
0	 16C00	 16C10	 16C20	 16C30	 16C40	 16C50	 16C60	
1	 16C01	 16C11	 16C21	 16C31	 16C41	 16C51	 16C61	 16C71
2	 16C02	 16C12	 16C22	 16C32	 16C42	 16C52	 16C62	 16C72
3	 16C03	 16C13	 16C23	 16C33	 16C43	 16C53	 16C63	 16C73
4	 16C04	 16C14	 16C24	 16C34	 16C44	 16C54	 16C64	 16C74
5	 16C05	 16C15	 16C25	 16C35	 16C45	 16C55	 16C65	 16C75
6	 16C06	 16C16	 16C26	 16C36	 16C46	 16C56	 16C66	 16C76
7	 16C07	 16C17	 16C27	 16C37	 16C47	 16C57	 16C67	 16C77
8	 16C08	 16C18	 16C28	 16C38	 16C48	 16C58	 16C68	 16C78
9	 16C09	 16C19	 16C29	 16C39	 16C49	 16C59	 16C69	 16C79
A	 16C0A	 16C1A	 16C2A	 16C3A	 16C4A	 16C5A		 16C7A
B	 16C0B	 16C1B	 16C2B	 16C3B	 16C4B	 16C5B		
C	 16C0C	 16C1C	 16C2C	 16C3C	 16C4C	 16C5C		
D	 16C0D	 16C1D	 16C2D	 16C3D	 16C4D	 16C5D		
E	 16C0E	 16C1E	 16C2E	 16C3E	 16C4E	 16C5E		
F	 16C0F	 16C1F	 16C2F	 16C3F	 16C4F	 16C5F		

Syllables in -i

16C00	𞐇	KPELLE SYLLABLE PI-BHI
16C01	𞐈	KPELLE SYLLABLE BI-MI
16C02	𞐉	KPELLE SYLLABLE KPI-GBI
16C03	𞐊	KPELLE SYLLABLE FI-VI
16C04	𞐋	KPELLE SYLLABLE TI-DI
16C05	𞐌	KPELLE SYLLABLE DI-TI
16C06	𞐍	KPELLE SYLLABLE LI-NI
16C07	𞐎	KPELLE SYLLABLE HI-JI
16C08	𞐏	KPELLE SYLLABLE YI-NYI
16C09	𞐐	KPELLE SYLLABLE KI-GI
16C0A	𞐑	KPELLE SYLLABLE KWI-GWI
16C0B	𞐒	KPELLE SYLLABLE GHI-NGI
16C0C	𞐓	KPELLE SYLLABLE NGWI
16C0D	𞐔	KPELLE SYLLABLE MIN
16C0E	𞐕	KPELLE SYLLABLE NIN

Syllables in -a

16C0F	𞐖	KPELLE SYLLABLE PA-BHA
16C10	𞐗	KPELLE SYLLABLE BA-MA
16C11	𞐘	KPELLE SYLLABLE KPA-GBA
16C12	𞐙	KPELLE SYLLABLE FA-VA
16C13	𞐚	KPELLE SYLLABLE TA-DA
16C14	𞐛	KPELLE SYLLABLE LA-NA
16C15	𞐜	KPELLE SYLLABLE HA-JA
16C16	𞐝	KPELLE SYLLABLE YA-NYA
16C17	𞐞	KPELLE SYLLABLE KA-GA
16C18	𞐟	KPELLE SYLLABLE GA-KA
16C19	𞐠	KPELLE SYLLABLE KWA-GWA
16C1A	𞐡	KPELLE SYLLABLE GHA-NGA
16C1B	𞐢	KPELLE SYLLABLE NGWA
16C1C	𞐣	KPELLE SYLLABLE WANG
16C1D	𞐤	KPELLE SYLLABLE MAN
16C1E	𞐥	KPELLE SYLLABLE NAN
16C1F	𞐦	KPELLE SYLLABLE NYAN
16C20	𞐧	KPELLE SYLLABLE NGAN

Syllables in -u

16C21	𞐨	KPELLE SYLLABLE PU-BHU
16C22	𞐩	KPELLE SYLLABLE KPU-GBU
16C23	𞐪	KPELLE SYLLABLE FU-VU
16C24	𞐫	KPELLE SYLLABLE TU-DU
16C25	𞐬	KPELLE SYLLABLE LU-NU
16C26	𞐭	KPELLE SYLLABLE HU-JU
16C27	𞐮	KPELLE SYLLABLE YU-NYU
16C28	𞐯	KPELLE SYLLABLE KU-GU
16C29	𞐰	KPELLE SYLLABLE WU
16C2A	𞐱	KPELLE SYLLABLE WUNG
16C2B	𞐲	KPELLE SYLLABLE MUN
16C2C	𞐳	KPELLE SYLLABLE NUN
16C2D	𞐴	KPELLE SYLLABLE NGUN

Syllables in -ee

16C2E	𞐵	KPELLE SYLLABLE PEE-BHEE
16C2F	𞐶	KPELLE SYLLABLE BEE-MEE
16C30	𞐷	KPELLE SYLLABLE KPEE-GBEE
16C31	𞐸	KPELLE SYLLABLE FEE-VEE
16C32	𞐹	KPELLE SYLLABLE TEE-DEE
16C33	𞐺	KPELLE SYLLABLE LEE-NEE
16C34	𞐻	KPELLE SYLLABLE HEE-JEE
16C35	𞐼	KPELLE SYLLABLE YEE-NYEE
16C36	𞐽	KPELLE SYLLABLE KEE-GEE
16C37	𞐾	KPELLE SYLLABLE KWEE-GWEE
16C38	𞐿	KPELLE SYLLABLE GHEE-NGEE
16C39	𞑀	KPELLE SYLLABLE WEE
16C3A	𞑁	KPELLE SYLLABLE NGWEE
16C3B	𞑂	KPELLE SYLLABLE NEEN

16C3C	𞑃	KPELLE SYLLABLE NYEEN
16C3D	𞑄	KPELLE SYLLABLE NGEEN

Syllables in -e

16C3E	𞑅	KPELLE SYLLABLE PE-BHE
16C3F	𞑆	KPELLE SYLLABLE BE-ME
16C40	𞑇	KPELLE SYLLABLE KPE-GBE
16C41	𞑈	KPELLE SYLLABLE FE-VE
16C42	𞑉	KPELLE SYLLABLE TE-DE
16C43	𞑊	KPELLE SYLLABLE LE-NE
16C44	𞑋	KPELLE SYLLABLE HE-JE
16C45	𞑌	KPELLE SYLLABLE YE-NYE
16C46	𞑍	KPELLE SYLLABLE KE-GE
16C47	𞑎	KPELLE SYLLABLE KWE-GWE
16C48	𞑏	KPELLE SYLLABLE GHE-NGE
16C49	𞑐	KPELLE SYLLABLE NGWE
16C4A	𞑑	KPELLE SYLLABLE E
16C4B	𞑒	KPELLE SYLLABLE MEN
16C4C	𞑓	KPELLE SYLLABLE NEN
16C4D	𞑔	KPELLE SYLLABLE NYEN
16C4E	𞑕	KPELLE SYLLABLE NGEN

Syllables in -o

16C4F	𞑖	KPELLE SYLLABLE PO-BHO
16C50	𞑗	KPELLE SYLLABLE BO-MO
16C51	𞑘	KPELLE SYLLABLE KPO-GBO
16C52	𞑙	KPELLE SYLLABLE FO-VO
16C53	𞑚	KPELLE SYLLABLE TO-DO
16C54	𞑛	KPELLE SYLLABLE LO-NO
16C55	𞑜	KPELLE SYLLABLE HO-JO
16C56	𞑝	KPELLE SYLLABLE KO-GO
16C57	𞑞	KPELLE SYLLABLE WO
16C58	𞑟	KPELLE SYLLABLE WONG
16C59	𞑠	KPELLE SYLLABLE MON
16C5A	𞑡	KPELLE SYLLABLE NON
16C5B	𞑢	KPELLE SYLLABLE NYON
16C5C	𞑣	KPELLE SYLLABLE NGON

Syllables in -oo

16C5D	𞑤	KPELLE SYLLABLE POO-BHOO
16C5E	𞑥	KPELLE SYLLABLE BOO-MOO
16C5F	𞑦	KPELLE SYLLABLE KPOO-GBOO
16C60	𞑧	KPELLE SYLLABLE FOO-VOO
16C61	𞑨	KPELLE SYLLABLE TOO-DOO
16C62	𞑩	KPELLE SYLLABLE LOO-NOO
16C63	𞑪	KPELLE SYLLABLE HOO-JOO
16C64	𞑫	KPELLE SYLLABLE YOO-NYOO
16C65	𞑬	KPELLE SYLLABLE KOO-GOO
16C66	𞑭	KPELLE SYLLABLE WOO

Syllable lengtheners

16C67	𞑮	KPELLE SYLLABLE M
16C68	𞑯	KPELLE SYLLABLE Y-NY
16C69	𞑰	KPELLE SYLLABLE NG

Numbers

16C71	1	KPELLE DIGIT ONE
16C72	2	KPELLE DIGIT TWO
16C73	3	KPELLE DIGIT THREE
16C74	4	KPELLE DIGIT FOUR
16C75	5	KPELLE DIGIT FIVE
16C76	6	KPELLE DIGIT SIX
16C77	7	KPELLE DIGIT SEVEN
16C78	8	KPELLE DIGIT EIGHT
16C79	9	KPELLE DIGIT NINE
16C7A	10	KPELLE NUMBER TEN

9. Figures.

Table IV The Kpelle Syllabary								
	i	a	u	e	ɛ	ɔ	o	-
p/b	ɸ (p)	ɸ (b)	#	ɸ (t)	ɸ	ɸ	ɸ (e)	
ɸ/m	ɸ	ɸ (m)		ɸ (x)	ɸ		ɸ (ju)	
kp/gb	ɸ (k)	ɸ (g)	ɸ	ɸ (u)	ɸ (g)	ɸ (e)	ɸ (h)	
f/v	ɸ (f)	ɸ (v)		[=fi/vi]	ɸ	ɸ (g)	ɸ (r)	
t/d	ɸ (t) (also di)	ɸ (d)	ɸ (t)	ɸ (t)	ɸ	ɸ or ɸ (g)	ɸ	
l/n	ɸ (l)	ɸ	ɸ (n)	ɸ (l)	ɸ (n)	ɸ (r)	ɸ (f)	
h(s)/j(z)	ɸ (h)	ɸ or ɸ (z)	ɸ	ɸ (h)	ɸ (h)	ɸ (o)	ɸ (h)	
y/ny	ɸ (y)	ɸ (n)		ɸ (y)	ɸ (y)			ɸ (o)

k/g	ɸ (k)	ɸ (g) (also ga)	ɸ (k)	ɸ (g)	ɸ (k)	ɸ	ɸ (k)	
kw/gw	ɸ (kw)			ɸ (kw)	ɸ (kw)			
ɸ (/ɸ)	ɸ (ɸ)	ɸ (ɸ)		[=ɸi]	ɸ (ɸ)			
ɸ or w			ɸ (ɸ or ɸ)			ɸ	ɸ	
w (/ɸw)	ɸ (w)	ɸ (w) ɸ (w)	ɸ (w)	[=wi]	ɸ (w)	ɸ (w)		
-		[=ɸa]		ɸ or ɸ (w)				
NASAL SYLLABLES	ĩ	ã	ũ	ẽ	ɛ̃	õ		SYLLABIC NASAL
m	ɸ (m)	ɸ or ɸ (m)	ɸ (m)			ɸ (m)		
n	ɸ (n)	ɸ (n)	ɸ (n)	[ɸ] ɸ (n)				
ny		ɸ (n)		[ɸ] ɸ (n)	[ɸ] ɸ (n)	ɸ (n)		
ɸ		ɸ (ɸ)						ɸ (m)

Figure 1. Table of Kpelle syllables from Dalby 1967.

Fig. 2. The Kpelle Syllabary¹

Fig.2. THE KPELLE SYLLABARY¹

	i	a	u	e	ε	ɔ	o
p/b	⊂	⊄	#	⊆	⊇	⊈	⊉
ɸ/m̄	⊂	⊄		⊆	⊇	⊈*	⊉
kp/gb	⊂	⊄	⊆	⊇	⊈	⊉	⊊
f/v	⊂	⊄	⊆*	⊇	⊈	⊉	⊊
t/d	⊂	⊄	⊆	⊇	⊈	⊉	⊊
l/n̄	⊂	⊄	⊆	⊇	⊈	⊉	⊊
h(s)/j(z)	⊂	⊄	⊆	⊇	⊈	⊉	⊊
y/āy	⊂	⊄	⊆*	⊇	⊈		⊉*
k/g	⊂	⊄	⊆	⊇	⊈	⊉	⊊
kw/gw	⊂	⊄		⊆	⊇		
r(ɹ)	⊂	⊄		⊆	⊇		
ɣ or w			⊆	⊇		⊈	⊉
w(ɥw)				⊆	⊇		

Nasal Syllables	ĩ	ā	ũ	ē	ẽ	õ			
m	⊂	⊄	⊆	=mi	⊈*	⊉			
n	⊂	⊄	⊆	=ni	⊈*	⊉*			
ŋ		⊄	⊆*	⊇*	⊈*	⊉*			
Syllable Lengthening									
m	⊂*								
ŋ	⊂*								
Numerals									
1	2	3	4	5	6	7	8	9	10
⊂*	⊄*	⊆*	⊇*	⊈*	⊉*	⊊*	⊋*	⊌*	⊍*

Figure 2. Table of Kpelle syllables from Stone 1990.

Fig. 1. Tax Records

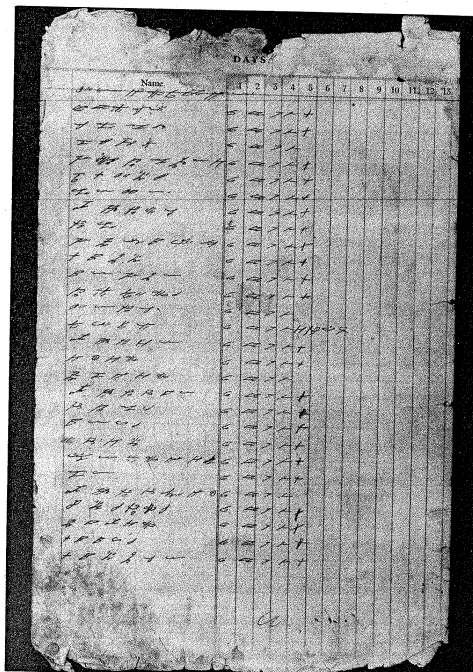


Figure 3. Sample of handwritten Kpelle text (a tax table).

A. Administrative

1. Title

Preliminary proposal for encoding the Kpelle script in the SMP of the UCS

2. Requester's name

Michael Everson and Chuck Riley

3. Requester type (Member body/Liaison/Individual contribution)

Individual contribution.

4. Submission date

2010-02-23

5. Requester's reference (if applicable)

6. Choose one of the following:

6a. This is a complete proposal

No.

6b. More information will be provided later

Yes.

B. Technical – General

1. Choose one of the following:

1a. This proposal is for a new script (set of characters)

Yes.

1b. Proposed name of script

Kpelle.

1c. The proposal is for addition of character(s) to an existing block

No.

1d. Name of the existing block

2. Number of characters in proposal

114.

3. Proposed category (A-Contemporary; B.1-Specialized (small collection); B.2-Specialized (large collection); C-Major extinct; D-Attested extinct; E-Minor extinct; F-Archaic Hieroglyphic or Ideographic; G-Obscure or questionable usage symbols)

Category A.

4a. Is a repertoire including character names provided?

Yes.

4b. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?

Yes.

4c. Are the character shapes attached in a legible form suitable for review?

Yes.

5a. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?

Jason Glavy and Michael Everson.

5b. If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used:

Michael Everson, FontLab.

6a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?

Yes.

6b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?

Yes.

7. Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?

Yes.

8. Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at <http://www.unicode.org> for such information on other scripts. Also see Unicode Character Database <http://www.unicode.org/Public/UNIDATA/UnicodeCharacterDatabase.html> and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

See above.

C. Technical – Justification

1. Has this proposal for addition of character(s) been submitted before? If YES, explain.

No.

2a. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)?

No.

2b. If YES, with whom?

2c. If YES, available relevant documents

3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?

See above.

4a. The context of use for the proposed characters (type of use; common or rare)

Relatively rare.

4b. Reference

5a. Are the proposed characters in current use by the user community?

Yes.

5b. If YES, where?

Scholars and some local use in Guinea and Liberia.

6a. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?

No.

6b. If YES, is a rationale provided?

6c. If YES, reference

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?

Yes.

8a. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?

No.

8b. If YES, is a rationale for its inclusion provided?

8c. If YES, reference

9a. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?

No.

9b. If YES, is a rationale for its inclusion provided?

9c. If YES, reference

10a. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?

No.

10b. If YES, is a rationale for its inclusion provided?

10c. If YES, reference

11a. Does the proposal include use of combining characters and/or use of composite sequences (see clauses 4.12 and 4.14 in ISO/IEC 10646-1: 2000)?

No.

11b. If YES, is a rationale for such use provided?

11c. If YES, reference

11d. Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?

No.

11e. If YES, reference

12a. Does the proposal contain characters with any special properties such as control function or similar semantics?

No.

12b. If YES, describe in detail (include attachment if necessary)

13a. Does the proposal contain any Ideographic compatibility character(s)?

No.

13b. If YES, is the equivalent corresponding unified ideographic character(s) identified?