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

Doc Type:	**Working Group Document**
Title:	**Investigation of Tangut unification issues**
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Status:	**Individual Contribution**
Action:	**For consideration by JTC1/SC2/WG2 and UTC**
Date:	**2019-02-10**

1. *Summary*

At the Ad hoc meeting on Tangut held at Yinchuan, China in August 2016, under the auspices of the Script Encoding Initiative, we were tasked with investigating seven possibly misunified Tangut ideographs identified by Profs. Jia Changye and Jing Yongshi, and were asked to report our findings and suggest a resolution to the issues (see WG2 N4736; L2/16-243). This document details our investigation, and concludes that the seven Tangut ideographs in question should not have been unified because there are subtle but systematic glyph differences that distinguish the two readings and meanings of each of these encoded characters. We think that two other Tangut ideographs that are distinguished in some sources only should also be disunified, pending agreement of other Tangut experts. Our recommendations are summarized below, and the proposed disunifications of nine Tangut ideographs are listed in Table 1:

- Seven Tangut ideographs (17F0D 㳫, 17F8A 㳫, 17FA5 㳫, 18139 㳫, 18147 㳫, 184F1 㳫, 18736 㳫) should be disunified, and eight new Tangut ideographs encoded at 187F8..187FE;

- Two Tangut ideographs (175F6 㳫 and 17134 㳫) are candidates for disunification, pending agreement with other Tangut experts.

- Five Tangut components (18843 㳫, 1888C 㳫, 1890A 㳫, 18915 㳫, 1893B 㳫) should be disunified, and five new components encoded at 18AFA..18AFE;

- The Tangut data file should be expanded to include a new key which gives the radical number and total stroke count for all encoded Tangut ideographs listed in Jia and Jing's *Table of Xixia Characters with Annotated Properties* (西夏字符及属性标注表) or other document;

- A new Tangut font which reflects Jia and Jing's analysis of the structure of Tangut components and ideographs should be provided for the code charts.

This document does not formally propose any new characters for encoding, but is made available for discussion. If Tangut experts from China agree with the proposed disunifications we will submit a joint proposal for the new characters in due course.

Table 1: Summary of Proposed Disunifications

Code Point	Current Glyph	New Glyph A	New Glyph B	Notes
17134	㤾	㤾	㤾	Glyph A = L2008-3488: "pair" [twe] Glyph B = L2008-3489: "foolish" [ngi̯a]
175F6	𗗶	𗗶	𗗶	Glyph A = L2008-1666: "fox" [nə] Glyph B = L2008-1667: "tail" [ta]
17F0D	𗼍	𗼍	𗼍	Glyph A = L2008-3436: "close relative" [saɯ] Glyph B = L2008-3435: "god" [·u]
17F8A	𗾊	𗾊	𗾊	Glyph A = L2008-2253: "warehouse" [vi̯ẹ] Glyph B = L2008-2252: "kind of bird" [mbu]
17FA5	𗾥	𗾥	𗾥	Glyph A = L2008-3683: "day after tomorrow" [sa] Glyph B = L2008-3684: "kind of bird" [śwê]
18139	𘄹	𘄹	𘄹	Glyph A = L2008-1317: "to brush" [twen] Glyph B = L2008-1318: "to jump" [lɪn]
18147	𘅇	𘅇	𘅇	Glyph A = L2008-1734: "negative particle" [ti] Glyph B = L2008-1735: "respectful" [kei]
184F1	𘓱	𘓱	𘓱	Glyph A = L2008-1107: "heaven" [ngwə] Glyph B = L2008-1106: "swallow" [me]
18736	𘜶	𘜶	𘜶	Glyph A = L2008-4457: "big" [li̯ẹ] Glyph B = L2008-4456: "wild goose" [tha]

We propose that for each row in the above table, Glyph A remains at the original code point, and Glyph B is assigned to a new code point.

2. Introduction

There are ten encoded Tangut ideographs which each explicitly unify two entries in Li Fanwen's 2008 *Tangut-Chinese Dictionary* (*Xià-Hàn zìdiǎn* 夏漢字典) that have the same glyph shape but have different readings and meanings (see Table 2). There are also a number of other encoded ideographs which unify two different entries in the 2008 dictionary, but those are insignificant glyph variants for the same semantic character, so are not relevant to this discussion.

Table 2: Tangut ideographs that unify two semantically-distinct entries in *Tangut-Chinese Dictionary* (Li Fanwen 2008)

C/P	Glyph	Entry A	Entry B
17134	胲	3488 "pair, couple" *twe̱ Common character.	3489 "foolish, stupid, clumsy" *gja̱ Uncommon character, normally in the word 繿胲 *kjwɨ gja̱ "foolish".
175F6	莅	1666 "fox" *nə Normally in the word 莅豾 *nə dźiə "fox".	1667 "tail, east" *ta Normally in the word 舵莅 *tji ta "tail, east".
17E08	纚	0406 "a transliteration" *djwi	0407 "to squeeze" (lice to death) *djwu
17F0D	�694	3435 "god, deity, divinity, supernatural being" *ɣu Rare character, normally only in the word 祂鬙 *ɣu mə "gods".	3436 "very close relative" *sa̱ Rare character, normally only in the word 胅祂 *sa̱ njij "very close relative".
17F8A	級	2252 "a kind of bird" (cuckoo) *bju Rare character, normally only in the word 級縂 *bju njij "cuckoo".	2253 "warehouse" *wji̱j Rare character, normally only in the word 蘸級 *·u̱ wji̱j "warehouse" or the surname 級莅 *wji̱j ·o.

C/P	Glyph	Entry A	Entry B
17FA5	燚	3683 "the day after tomorrow" *sja Common character, in the word 燚燚 *sja djij "day after tomorrow", used as a particle, or as a transcription character.	3684 "a kind of bird" *śie Rare character, normally only in the words 纅燚 *dźjwow śie "kind of bird" and 龠燚 *xjow śie "kind of bird".
18139	叕	1317 "to brush, to whisk" *twe Uncommon character.	1318 "to jump, to leap" *ljij Uncommon character.
18147	叕	1734 "a prefix representing no" *tji Common character.	1735 "respectful" *kwej Uncommon character.
184F1	叕	1106 "swallow" (bird) *mẹ Uncommon character, normally only in the word 叕燚 *mẹ rjir "swallow".	1107 "heaven, emperor" *ŋwə Common character.
18736	叕	4456 "wild goose" *tha Rare character, only in the word 叕燚 *tha xa "wild goose" = Chinese 大雁 dàyàn.	4457 "big, great, large" *ljịj Very common character.

* In the above table readings are as given in Li Fanwen's 2008 dictionary. Elsewhere in this document, M. V. Sofronov's readings in E. I. Kychanov's 2006 Tangut dictionary are used.

In the 2008 edition of Li Fanwen's dictionary, which was the primary source for the encoded set of Tangut ideographs, each pair of these ten entries are written with exactly the same glyph using a computer font designed for the dictionary by Prof. Jing Yongshi (a modified version of this font is also used for the Unicode and ISO/IEC 10646 code charts). Other modern dictionaries and character lists that were used as sources for the encoding also do not graphically distinguish these pairs of characters (see Table 3). In addition, Han Xiaomang's 2004 PhD dissertation on Tangut orthography provides only a single glyph form for each pair of semantically-distinguished characters.

Table 3: Entries for unified characters in modern sources

Unicode	Li Fanwen 2008	Li Fanwen 1997	Li Fanwen 1986	Shi Jinbo et al. 1983	Han Xiaomang 2004	Kychanov 2006	Sofronov 1968	Nishida 1966
17134 㟴	㟴 3488 [twe̠] 㟴 3489 [gja̠]	㟴 3488 㟴 3489	㟴 0590 㟴 0589	㟴 0458	㟴 0272 0280	㟴 2977 [twe] 㟴 2976 [ngi̠a]	㟴 1402 [twe] 㟴 1401 [nga]	
175F6 㷖	㷖 1666 [nə] 㷖 1667 [ta]	㷖 1666 㷖 1667	㷖 1439 㷖 1440	㷖 1807	㷖 1968 2046	㷖 4680 [nə]	㷖 5351 [ndə] 㷖 5352 [ta]	㷖 218-061 [nɨ]
17E08 瓹	瓹 0406 [djwi] 瓹 0407 [djwu]	瓹 0406 瓹 0407	瓹 3944 瓹 3945	瓹 3044	瓹 3390 3514	瓹 5297	瓹 0382 瓹 0381 [ndwu]	瓹 123-091
17F0D ��	獥 3435 [ɣu] 獥 3436 [sa̠]	獥 3435 獥 3436	獥 2905 獥 3348	獥 3641 獥 3640	獥 3619 3751	獥 3388 [·u] 獥 3389 [sau]	獥 3308 [·u] 獥 3339 [sau]	
17F8A 㤀	㤀 2252 [bju] 㤀 2253 [wjij]	㤀 2252 㤀 2253	㤀 3472 㤀 3471	㤀 3384	㤀 3743 3877	㤀 3562 [vi̠e]	㤀 5669 [mbu] 㤀 5670 [vi̠e]	㤀 211-041 [mǐu] 㤀 211-043 [we̠]
17FA5 㴰	㴰 3683 [sja] 㴰 3684 [śie]	㴰 3683 㴰 3684	㴰 3491 㴰 3492	㴰 3400	㴰 3769 3903	㴰 2109 [sa]	㴰 5705 [sa] 㴰 5706 [śwê]	㴰 211-067 [saɦ]

Unicode	Li Fanwen 2008	Li Fanwen 1997	Li Fanwen 1986	Shi Jinbo et al. 1983	Han Xiaomang 2004	Kychanov 2006	Sofronov 1968	Nishida 1966
180D6* 𘃖	5191 [zar]	5191	4670	2753	4583 4735	4448 [źạ]	2131 [żạ]	
182F5* 𘋵	5190 [bọ]	5190	4671	2740			2636 [mbọ]	
18139 𘄹	1317 [twe] / 1318 [ljij]	1317 / 1318	4378 / 4374	3231	4154 4297	2374 [twen]	4766 [twen] / 4767 [lɪn]	
18147 𘅇	1734 [tɕi] / 1735 [kwej]	1734 / 1735	4387 / 4388	3238 / 3239	4166 4309	3262 [ti] / 3263 [kei]	4743 [ti] / 4732 [kwei]	230-062 [tɿ]
184F1 𘓱	1106 [mẹ] / 1107 [ŋwə]	1106 / 1107	5537 / 5538	4449	5021 5188	3448	0466 [me] / 0465 [ngwə]	261-052
18736 𘜶	4456 [tha] / 4457 [ljij]	4456 / 4457	2621 / 2622	4815	5594 5779	3411 [lịẹ] / 3410 [tha]	0971 [lịẹ] / 0972 [tha]	17c-052 [le] / 17c-051 [thaɦ]

* In addition to the ten pairs of unified ideographs listed in Table 2, Table 3 also includes the pair of encoded ideographs 182F5 𘋵 [mbọ] "vulture" and 180D6 𘃖 [źạ] "fountainhead" which actually have the same left side component (𘋵) in Tangut source texts and would have been unified if the left side of 180D6 𘃖 had not been misidentified as 𘃖 in Li Fanwen's dictionary.

As the sources used for encoding Tangut did not distinguish these characters at the graphic level, and following the principles of CJK encoding where graphically identical characters with multiple distinct readings and meanings are unified (e.g. 樂 is encoded as a single character representing both "joy" [Mandarin *lè*; Japanese *raku*) and music" [Mandarin *yuè*; Japanese *gaku*]), these ten pairs of Tangut ideographs were explicitly unified for encoding.

In December 2013, at the international meeting on encoding the Tangut script held in Beijing, China (see Deborah Anderson's summary report: WG2 N4516; L2/13-241), the unification of these characters was discussed, and although some experts were in favour of encoding them as separate characters, no-one stood up and stated that there were graphic differences which meant that they should not be unified. As a result, it was agreed by all participants to unify the pairs of characters listed in Table 2 (as summarised in bullet point 1.2 of the meeting report). In the subsequent final proposal document submitted in January 2014 (WG2 N4522; L2/14-023), which was co-authored by Andrew West (UK), Michael Everson (Ireland), Han Xiaomang (China), Jia Changye (China), Jing Yongshi (China), and Viacheslav Zaytsev (Russia), nine pairs of homoglyph characters were explicitly unified (see §5.2.2 Homoglyphs).

Prof. Arakawa Shintarō discussing 𘙆 (18736) at the Beijing 2013 Tangut meeting

Note how the two meanings of the character 𘙆 on the whiteboard are written the same

During the ISO balloting process, West, Zaytsev and Everson carried out extensive reviews of the Tangut repertoire, and pointed out a large number of glyph corrections where the glyph used in Li Fanwen's 2008 dictionary was incorrect or suboptimal (see WG2 N4588R2; L2/14-209R). However, no experts raised any concerns about the unified homoglyphs during the ballot period.

Then in August 2016, just two months after the release of Unicode 9.0 which incorporated the Tangut script, West, Zaytsev and Everson attended a meeting on encoding Khitan scripts held at Yinchuan in China (see Deborah Anderson's summary report #1: WG2 N4736; L2/16-243). Many of the Khitan experts were also Tangut experts, and so at the request of the Chinese experts, half a day of the meeting was also devoted to discussion of some issues with the encoded Tangut repertoire that Profs. Jing Yongshi and Jia Changye reported that they had recently discovered. Jing and Jia informed us that they had made important advances in the understanding and analysis of the structure, stroke order and stroke count of Tangut characters. They reported that there are subtle but significant differences in the way some Tangut components are written, with the result that the stroke counts provided in the ISO/IEC 10646 and Unicode Tangut data files are not ideal in many cases (this can be remedied by adding a new key for their preferred radical and stroke count data, whilst keeping the original kRSTUnicode key as this reflects the ordering of Tangut ideographs in the Tangut block). Furthermore, they demonstrated to us that a few encoded components are systematically written in two slightly different ways (with differing stroke counts) in different sets of ideographs, and that this component glyph variation is semantic and not merely cosmetic. They therefore believe that a small number of encoded Tangut components should be disunified into two components with slightly different glyphs forms and differing stroke counts.

Jia and Jing provided us with a draft version of their *Table of Xixia Characters with Annotated Properties* 西夏字符及属性标注表（草稿）dated August 2016, which lists all Tangut ideographs (including numerous variant forms) by radical and stroke count (see Zhonghua ziku… 2016). Their document graphically distinguishes two separate components for each of the five encoded Tangut components listed in Table 4 below.

Table 4: Components disunified by Jia and Jing

Code Point	Unicode Component	Code Chart Glyph	Stroke Count	Disunified Component	Stroke Count
18843	068	乡	3	乡	2
1888C	141	彡	4	彡	3
1890A	267	彡	5	彡	3
18915	278	犭	5	犭	4
1893B	316	犭	5	犭	4

Currently, for all encoded components containing the element ⼊, this element is written as three strokes, with a disjoint between the first and third stroke; but according to the analysis of Jing and Jia, in some components this element is written as three strokes, but in other components it is written as two strokes, with the first and third strokes written as single bent stroke. The stroke order of the components listed in Table 4 is illustrated in Table 5.

Table 5: Stroke order of potentially disunifiable components
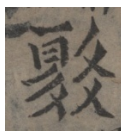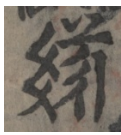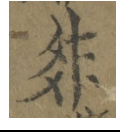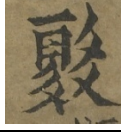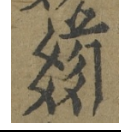
Code Point	Unicode Comp.	Jia & Jing Radical	Stroke Count	1st Stroke	2nd Stroke	3rd Stroke	4th Stroke	5th Stroke
18843	068	16	2	〈	〈			
		45	3	ノ	ノ	〈		
1888C	141	51	3	ノ	〈	〈		
		107	4	ノ	ノ	ノ	〈	
1890A	267	52	3	〈	〈	〈		
		201	5	ノ	ノ	〈	〈	〈
18915	278	121	4	'	⊥	〈	〈	
		211	5	'	⊥	ナ	方	友
1893B	316	137	4	⊐	⊐	弓	弓	
		238	5	⊐	⊐	弓	弓	弓

There are a number of other encoded Tangut components that Jia and Jing analyse as having a single bent stroke rather than two disjoined strokes (e.g. they analyse Unicode Component 144 ⼊ as having 3 strokes), but in these cases all ideographs with these components are written the same way, so there are no disunification issues, and there is no need to discuss them further in this document.
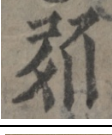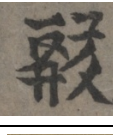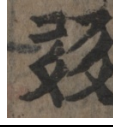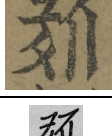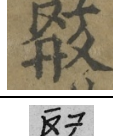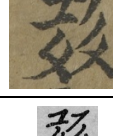
Seven of the ten pairs of Tangut ideographs listed in Table 2 incorporate either Component 267 (⼊) or Component 316 (弓), and it is Jing and Jia's contention that these seven pairs of characters can actually be distinguished graphically due to the difference in the way that components 267 and 316 are written in each character. Therefore, they suggest that the unification of these seven pairs of characters was a mistake, and the seven encoded characters should be disunified into two separate encoded characters.

Table 6: Example glyph forms for ideographs with Component 267

	Type A 攵		Type B 攵	
	17F8B	18740	17FC5	17E50
Sea of Writing [WH]				
Homophones [TY B2]				
Sea of Writing (Kepping et al. 1969)				
Sea of Writing (Shi Jinbo et al. 1983)				
Homophones (Li Fanwen, 1986)				
Mojikyō font				
Jing Yongshi font				

Table 7: Example glyph forms for ideographs with Component 316

	Type A 弓		Type B 弓	
	18131	18500	18134	18098
Sea of Writing [WH]				
Homophones [TY B2]				
Sea of Writing (Kepping et al. 1969)				
Sea of Writing (Shi Jinbo et al. 1983)				
Homophones (Li Fanwen, 1986)				
Mojikyō font				
Jing Yongshi font				

In order to more clearly illustrate the distinctions in the graphic forms of these components, example ideographs for both forms of Component 267 (𰀀) and Component 316 (𰀀) are given in Table 6 and Table 7. For each component type, one ideograph has the component on the left side, and one ideograph has the component on the right side. For each ideograph, images of the characters from the two major works of Tangut lexicography, *Sea of Writing* (𘜶𗰣 = *Wénhǎi* 文海 [WH]) and *Homophones* (𗙏𘙰 = *Tóngyīn* 同音 [TY]) are shown. The five-stroke forms of Component 267 and Component 316 (with disjoined strokes) are referred to as Type A, whereas the three-stroke form of Component 267 and the joined four-stroke form of Component 316 (with joined strokes) are hereafter referred to as Type B.

In these examples the distinction between the Type A and Type B forms of these two components is very clear in the original Tangut texts, and the glyph forms are consistent in both the *Sea of Writing* and *Homophones*. For comparison, the corresponding glyphs in modern scholarly editions of the *Sea of Writing* and *Homophones*, as well as the Mojikyō font glyphs (used in Kychanov's 2006 Tangut dictionary) and Jing Yongshi's font glyphs (used in Li Fanwen's 2008 Tangut dictionary) are also shown. None of these modern editions or fonts show any distinction between the two component forms, and the components are normalized to the same glyph form. We do not know of any modern sources which do otherwise.

With hindsight the difference between the Type A and Type B forms of these two components is very distinct, and it now seems obvious to us that they are different components, but in over a hundred years of Tangutology, it seems that no-one has explicitly stated that these are separate components before Jia and Jing raised the issue in 2016. Scholars of the Tangut script have treated the differences between Types A and B as insignificant variations in handwriting, probably reflecting their assumptions that the construction of strokes in the Tangut script imitates the Han script where there are no similar examples of components that vary in this way.

It should be noted that this is not the first time that very similar Tangut components which can be easily mistaken for each other have been shown to be distinct and unrelated. Components 192 (𰀀) and 296 (𰀀) were treated as the same component in the 1997 edition of Li Fanwen's dictionary and most other modern works of Tangut scholarship. Likewise, there used to be confusion among many Tangut scholars over the status of Components 031 (𰀀), 086 (𰀀) and 170 (𰀀) which were often considered to be variant ways of writing the same component. Prof. Jing Yongshi clarified that these five components were not interchangeable, and in the 2008 edition of Li Fanwen's dictionary they were correctly treated as separate components. The identification of glyph distinctions for Components 267 and 316 by Jing and Jia should be seen as a continuation of a long process of understanding Tangut orthography.

The consistent treatment of Component 267 and Component 316 in two different primary sources (*Sea of Writing* and *Homophones*) in the above examples is very suggestive that the two different components have been mistakenly unified by modern scholars. However, this is not conclusive evidence, and in order to test this theory we need to systematically analyse the forms of Component 267 and Component 316 in all characters including these components.

At the 2016 meeting in Yinchuan Andrew West was given an action to investigate this issue and recommend a resolution:

> West will gather evidence for 7 character forms currently unified in Unicode, but for which there may be a difference in how they are written. Based on the evidence, West will propose what to do (i.e., disunify the forms or use variation sequences with the variation captured in a font).
>
> — WG2 N4736; L2/16-243

We present our analysis of the potentially misunified pairs of Tangut ideographs in the next section of this document. In addition to the seven pairs of characters raised by Jing and Jia, we also examine the three other pairs of unified ideographs shown in Table 2.

3. Analysis

3.1 Methodology

Tangut ideographs are not constructed from a component with a fixed semantic meaning (radical) and a component with a relatively fixed phonetic value, as is the case for the vast majority of Han ideographs. Rather, each Tangut ideograph is constructed from two or more components which are derived from other Tangut ideographs in an idiosyncratic and sometimes hard to understand way. In the typical case, one part of a Tangut ideograph is derived from another Tangut ideograph with a related meaning (the semantic parent), and the other part is derived from another Tangut ideograph with the same pronunciation (the phonetic parent). For example, 緜 "dawn" [wɛ] is derived from the left side of 鿀 "to realize" [wɛ] (phonetic parent) and the right side of 緜 "morning" [sɪn] (semantic parent).

Although derivation from a single semantic parent and a single phonetic parent is most prevalent, there are a variety of other types of derivation, such as multiple semantic parents which are synonyms (e.g. 龝 "mouse" is derived from the left side of 龝 "ground rat" and the right side of 緜 "mouse"), multiple semantic parents which are descriptive (e.g. 緜 "silver" is derived from the right of 鿀 "white" and the bottom of 蘳 "gold"), and multiple phonetic parents indicating a *fǎnqiè* reading (e.g. the phonetic transcription character 緜 [tɕi̯wa] is derived from the top and left side of 緜 [tɕie] and the whole of 慫 [ɕi̯wa], which gives the reading [tɕ-] + [-i̯wa] = [tɕi̯wa]).

However, unlike the Han script, the derived components do not have an intrinsic semantic or phonetic value, as these depend upon the particular ideograph that the component is derived from, and any given component may be borrowed for either the semantic or phonetic value of the source ideograph. For example, the component 彡 in 緜 "to desire" [tshi] is derived from the left side of 鿀 "to need" [ɕi̯wɛ] (semantic parent), whereas the component 彡 in 緜 "a kind of plant" [ton] is derived from the right side of 緜 "to get" [ton] (phonetic parent), and the component 彡 in 緜 "a surname" [ꞏo] is derived from the left side of 緜 "month" [ꞏo] (phonetic parent).

The Tangut dictionary *Sea of Writing* provides an explanation for the construction of each Tangut ideograph, listing the parent ideographs from which each component of the child ideograph derives from. This allows us to build up chains of related characters which share the same component, either as a semantic element or as a phonetic element (in many cases the derivation given in *Sea of Writing* is circular, but that does not matter for this exercise).

We can state as a rule that the same component in a chain of related ideographs should be written with the same glyph form in the same position (there are some components that have different glyph forms depending upon whether the component is positioned on the left side, right side, or top of the ideograph). Therefore if the five encoded components listed in Table 4 really do each represent two different components, we should find that for any given chain of Tangut ideographs related by one of these five components, all ideographs should share the same glyph form. If, on the other hand, chains of Tangut ideographs show a mixture of both glyph forms for

these five components, then that would indicate that the glyph variations are not semantically significant, and should not be reflected at the encoding level.

In order to test whether there is a semantic difference between the 3-stroke and 5-stroke glyph forms of Component 267, and between the 4-stroke and 5-stroke glyph forms of Component 316, we analysed the chaining relationships and glyph forms for all encoded Tangut ideographs that include either of these two components. We do not analyse the other three components given in Table 4 (Components 068, 141, 278) as there are no pairs of unified ideographs with these components. The results of this analysis are tabulated in the appendix (see Section 6.1 for Component 267, and Section 6.2 for Component 316).

Chaining relationships is based on the character derivations given for head entries in *Sea of Writing* (printed edition), *Precious Rimes of Sea of Writing* (manuscript edition), and *Combined Edition of Homophones and Sea of Writing* (manuscript editions). In some cases, where no head entry survives in any of these sources, we have postulated a probable derivation based on a combination of graphic, semantic or phonetic similarities. These unsourced derivations are given in square brackets.

For glyph comparison purposes we provide images of each character (where available) from xylographic editions of five major works of Tangut lexicography or phonetics that were printed during the Western Xia period:

- *Sea of Writing* (*Wénhǎi* 文海) volumes I and III

- *Homophones* (*Tóngyīn* 同音) A edition (preface dated 1132)

- *Homophones* (*Tóngyīn* 同音) B edition (various exemplars)

- *Mixed Characters* (*Zázì* 雜字) (colophon dated 1187)

- *Pearl in the Palm* (*Fān-Hàn héshí zhǎngzhōngzhū* 番漢合時掌中珠) (preface dated 1190)

In order to check whether the distinction between Type A and Type B glyph forms shown in the above sources are maintained throughout the Tangut corpus, in Section 6.3 we provide a sample of 36 characters with Component 267 and 28 characters with Component 316 from a range of different types of texts dating from the Western Xia, Yuan and Ming periods.

- *Collected Writings of the Shining Speech of Three Generations* (*Sānshìshǔ míngyán jíwén* 三世屬明言集文), a Western Xia Buddhist text printed using movable type

- *Homonyms* (*Zéyào chángchuán tóngmíng zázì* 擇要常傳同名雜字), a Western Xia xylographic edition of a linguistic text

- *Proverbs* (*Yànyǔ* 諺語), a Western Xia xylographic edition of a secular literary text (colophon dated 1187)

- *Odes* (*Shī* 詩), a Western Xia xylographic edition of a secular poetic text (colophons dated 1185–1187)

- *Forest of Categories* (*Lèilín* 類林), a Western Xia xylographic edition (colophon dated 1181)

- *Newly Collected Grains of Gold Placed in the Palm Text* (*Xīnjí suìjīn zhìzhǎngwén* 新集碎金置掌文), a Western Xia hand-written text

- *Avataṃsaka Sūtra* (*Dàfāngguǎng fó huáyán jīng* 大方廣佛華嚴經), a xylographic edition of a Buddhist sutra thought to have been printed during the Yuan dynasty
- Yuan dynasty Buddhist inscriptions at Juyong Pass, dated 1345
- Ming dynasty dhāraṇī pillar inscriptions at Baoding, dated 1502

3.2 Component 267

We analysed 307 encoded Tangut ideographs that incorporate Component 267 or other supercomponents of Component 267 such as 𗤛 𗤜 𗤝 𗤞 𗤟 𗤠. These are listed in 38 groups in the appendix (Section 6.1), and summarized in Table 8 (the five unified ideographs with two readings and meanings are highlighted in yellow). We were able to identify 35 chains of graphically-related ideographs, ranging from just two ideographs up to fifty-four ideographs. There is a very clear division between chains of ideographs with Component 267 written with five strokes (Type A: 𗤛) and chains of ideographs with Component 267 written with three strokes (Type B: 𗤜). 16 chains (Groups 1–16) have Type A components, and 19 chains (Groups 19–37) have Type B components. There are 44 ideographs which are not assigned to a chain due to lack of evidence, of which 25 have Type A components (Groups 17–18), and 19 have Type B components (Group 38). In total, about half of the ideographs analysed have Type A components and about half have Type B components.

Table 8: Summary of Component 267 groups

Group	Count	Tangut ideographs	Type
1	54	𗥤𗥥𗥦𗥧𗥨𗥩𗥪𗥫𗥬𗥭<mark>𗥮</mark>𗥯𗥰𗥱𗥲𗥳𗥴𗥵𗥶𗥷𗥸<mark>𗥹</mark>𗥺𗥻𗥼𗥽𗥾𗥿 𗦀𗦁𗦂𗦃𗦄𗦅𗦆𗦇𗦈𗦉𗦊𗦋𗦌𗦍(𗦎)𗦏𗦐𗦑𗦒𗦓𗦔𗦕𗦖𗦗𗦘𗦙𗦚𗦛𗦜	A
2	6	𗦝𗦞𗦟𗦠𗦡𗦢	A
3	8	<mark>𗦣</mark>𗦤𗦥𗦦𗦧𗦨𗦩𗦪	A
4	4	𗦫𗦬𗦭𗦮	A
5	2	𗦯𗦰	A
6	2	𗦱𗦲	A
7	7	𗦳𗦴𗦵𗦶𗦷𗦸𗦹	A
8	5	𗦺𗦻𗦼𗦽𗦾	A
9	8	𗦿𗧀𗧁𗧂𗧃𗧄𗧅𗧆	A
10	9	𗧇𗧈(𗧉)𗧊𗧋𗧌𗧍𗧎𗧏𗧐	A
11	5	𗧑𗧒𗧓𗧔𗧕	A

Group	Count	Tangut ideographs	Type
12	4	𗿀𗿁𗿂𗿃	A
13	17	𗿄𗿅𗿆𗿇𗿈𗿉𗿊𗿋𗿌𗿍𗿎𗿏𗿐𗿑𗿒𗿓𗿔	A
14	2	𗿕𗿖	A
15	3	𗿗𗿘𗿙	A
16	2	𗿚𗿛	A
17	21	𗿜𗿝𗿞 <mark>𗿟</mark> 𗿠𗿡𗿢𗿣𗿤𗿥𗿦𗿧𗿨𗿩𗿪𗿫𗿬𗿭𗿮 <mark>𗿯</mark> 𗿰	A
18	4	𗿱 𗿲𗿳𗿴 (𗿵)	A
19	4	<mark>𗿶</mark> 𗿷𗿸𗿹	B
20	12	𗿺𗿻𗿼𗿽𗿾𗿿𘀀𘀁𘀂𘀃𘀄𘀅	B
21	21	𘀆𘀇𘀈𘀉𘀊𘀋𘀌𘀍𘀎𘀏𘀐 <mark>𘀑</mark> 𘀒𘀓𘀔𘀕𘀖𘀗𘀘𘀙𘀚	B
22	9	𘀛𘀜𘀝𘀞𘀟𘀠𘀡𘀢𘀣	B
23	2	𘀤𘀥	B
24	2	𘀦𘀧	B
25	11	𘀨𘀩𘀪𘀫𘀬𘀭𘀮𘀯𘀰𘀱𘀲	B
26	9	𘀳𘀴𘀵𘀶𘀷𘀸𘀹𘀺𘀻	B
27	6	𘀼𘀽𘀾𘀿𘁀𘁁	B
28	25	<mark>𘁂</mark> 𘁃𘁄𘁅𘁆𘁇𘁈𘁉𘁊𘁋𘁌𘁍𘁎𘁏𘁐 <mark>𘁑</mark> 𘁒𘁓𘁔𘁕𘁖𘁗𘁘𘁙𘁚	B
29	5	𘁛𘁜𘁝𘁞𘁟	B
30	3	𘁠𘁡𘁢	B
31	2	𘁣𘁤	B
32	3	𘁥𘁦𘁧	B
33	2	𘁨𘁩	B
34	2	𘁪𘁫	B
35	2	𘁬𘁭	B
36	2	𘁮𘁯	B
37	3	𘁰𘁱𘁲	B
38	19	𘁳𘁴𘁵𘁶𘁷𘁸𘁹𘁺𘁻𘁼𘁽 <mark>𘁾</mark> 𘁿𘂀𘂁𘂂𘂃𘂄𘂅	B

With only a handful of exceptions, ideographs in the same chain are all written with the same form of Component 267 (i.e. either all Type A or all Type B). Furthermore, the use of Type A or Type B is generally consistent for the same ideograph across multiple texts. It is especially noticeable that all ideographs with meanings related to birds have Type A components (Groups 1–6, and Group 17), although Type A components are not restricted ideographs related to birds.

The only unambiguous example of a character not having the expected component type for the chain it belongs to is 1731C 㩲 "dew" (Group 9), which has a Type B right side component in all sources, but *Sea of Writing* derives the right side component from 18324 㪍 "strip" which has a Type A right side component. In this case, the derivation in *Sea of Writing* may be wrong or the parent character written incorrectly, because the derived character "strip" does not make sense as either a semantic or phonetic parent for "dew" (the left and middle components of "dew" derive from 172FD 㳰 "water" and 18696 㶍 "moist" respectively, which do make sense).

The level of distinction between Type A and Type B components varies from character to character. The distinction is usually most obvious for characters with just two components side-by-side, and is not always so clear where the component occurs in the middle of a character or the component is laterally compressed because the ideograph consists of three or more components side-by-side. In these situations the start point of a disjoined stroke may touch the endpoint of another stroke, with the result that there may only be a very subtle distinction between two component forms (Type A shows a narrowing of the strokes where they join, whereas Type B shows a thicker joint). In particular, the top strokes of Type A glyphs often appears to be joined like the top strokes of Type B glyphs (see for example 㶱 and some other ideographs listed in Groups 10–12 of Section 6.1), but this is not consistent, and often varies for the same character depending on the source. For example, the form of 17F95 㾵 "swallow" in *Homophones* Edition A shows the top strokes joined on the left component, whereas the same character in *Homophones* Edition B shows a clear disjoint between the top strokes of the left component:
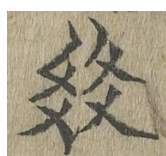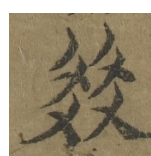
Homophones A	*Homophones* B2
TY A 46B34	TY B2 47A48

It does not seem to us that there is a consistent and meaningful distinction in such cases, and we think that these differences should be considered as variant ways of writing the same component. The main distinguishing feature of Type A compared with Type B appears to be the disjoint of the bottom two strokes.

The distinction between Type A and Type B components also varies from source to source. The distinction is generally clearer in *Sea of Writing* and *Homophones* than in *Mixed Characters* and *Pearl in the Palm*. Looking at a wider range of Tangut texts, (see Section 6.3 "Evidence from Other Sources" Table A), we can see that the distinction between Types A and B is clearly preserved in
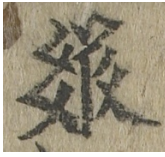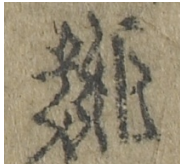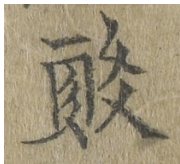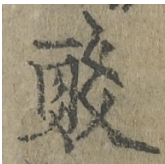
most texts. For most characters listed in Section 6.3 Table A, the sources dating from the Western Xia period (both printed and manuscript) concur with *Sea of Writing* and *Homophones* with respect to usage of Type A versus Type B components, although there are some unexpected glyph forms. For example, in *Proverbs* 17FFC 纔 is written both with the expected Type A component and with the unexpected Type B component in different places. However, given that miswritten characters (e.g. with missing or additional strokes) are quite common in all Tangut texts, it is not at all surprising that scribes would occasionally write a character with the wrong component shape. The post-Western Xia sources are much less consistent, and in particular the Yuan dynasty edition of the *Avataṃsaka Sūtra* writes most Type B components as Type A.

The five encoded ideographs 17F0D 猲, 17F8A 猭, 17FA5 猻, 184F1 獤, and 18736 獩 all incorporate Unicode Component 267 (犭), and each have two distinct meanings and readings. For these five characters, one meaning of each is related to birds, and one meaning is unrelated to birds (it is not immediately obvious that 17F0D 猲 "god" is related to birds, but in the Tangut text *Synonyms* this character is included in a synonym group with other characters meaning "vulture"). Reflecting the general observation for Component 267, all five bird-related meanings are written with a Type A component, whereas the five other meanings are all written with a Type B component. A comparison of the glyph forms in *Homophones* [TY] for each of these pairs, showing this clear distinction, is given in Table 9. In addition, the pair of encoded ideographs 182F5 獳 [mbọ] "vulture" and 180D6 獷 [źạ] "fountainhead" actually have the same left side component (犭), and differ by the glyph type of the middle component.

Table 9: Tangut ideographs which differ by Component 267 glyph type

Type A (犭)	Type B (犭)
17F0D "god" L2008-3435 TY A 41B26	17F0D "close relative" L2008-3436 TY A 33B72
17F8A "kind of bird" L2008-2252 TY B5 04B36	17F8A "warehouse" L2008-2253 TY B5 11A78

Type A (夋)	Type B (夋)
17FA5 "kind of bird" L2008-3684 TY A 39A51	17FA5 "day after tomorrow" L2008-3683 TY A 31B61
182F5 "vulture" L2008-5190 TY A 05A42	180D6 "fountainhead" L2008-5191 TY A 52A17
184F1 "swallow" L2008-1106 TY A 04A36	184F1 "heaven" L2008-1107 TY A 26A77
18736 "wild goose" L2008-4456 TY B2 13B77	18736 "big" L2008-4457 TY B2 50A72

3.3 Component 316

We analysed 254 encoded Tangut ideographs that incorporate Component 316 or other supercomponents of Component 316 such as 夋 夋 夋. These are listed in 37 groups in the appendix (Section 6.2), and summarized in Table 10 below (the two unified ideographs with two readings and meanings are highlighted in yellow). We were able to identify 35 chains of graphically-related ideographs, ranging from just two ideographs up to thirty-six ideographs.

There is a very clear division between chains of ideographs with Component 316 written with five strokes (Type A: 𢒹) and chains of ideographs with Component 316 written with three strokes (Type B: 𢒸). 18 chains (Groups 1–18) have Type A components, and 16 chains (Groups 21–36) have Type B components. There are 20 ideographs which are not assigned to a chain due to lack of evidence, of which 3 have Type A components (Group 20), and 20 have Type B components (Group 37). In addition there are two ideographs with Type A components (Group 19) which do not derive Component 316 from a single parent ideograph. In total, about half of the ideographs analysed have Type A components and about half have Type B components.

Table 10: Summary of Component 316 groups

Group	Count	Tangut ideographs	Type
1	36	𗥠 𗥡 𗥢 𗥣 𗥤 𗥥 𗥦 𗥧 𗥨 𗥩 𗥪 𗥫 𗥬 𗥭 𗥮 𗥯 𗥰 𗥱 𗥲 𗥳 𗥴 𗥵 𗥶 𗥷 𗥸 𗥹 𗥺 𗥻 𗥼 𗥽 𗥾 𗥿 𗦀 𗦁 𗦂 𗦃	A
2	7	𗦄 𗦅 𗦆 𗦇 𗦈 𗦉 𗦊	A
3	14	𗦋 𗦌 𗦍 𗦎 𗦏 𗦐 (𗦑) 𗦒 𗦓 𗦔 𗦕 𗦖 𗦗 𗦘	A
4	9	𗦙 𗦚 𗦛 𗦜 𗦝 𗦞 𗦟 𗦠 𗦡	A
5	4	𗦢 𗦣 𗦤 𗦥	A
6	13	𗦦 𗦧 𗦨 𗦩 𗦪 𗦫 𗦬 𗦭 𗦮 𗦯 𗦰 (𗦱) 𗦲 𗦳	A
7	7	𗦴 𗦵 𗦶 𗦷 𗦸 𗦹 𗦺	A
8	2	𗦻 𗦼	A
9	2	𗦽 𗦾	A
10	2	𗦿 𗧀	A
11	3	𗧁 𗧂 𗧃	A
12	2	𗧄 𗧅	A
13	3	𗧆 𗧇 𗧈	A
14	2	𗧉 𗧊	A
15	2	𗧋 𗧌	A
16	2	𗧍 𗧎	A
17	3	𗧏 𗧐 𗧑	A
18	2	𗧒 𗧓	A
19	2	𗧔 𗧕	A
20	3	𗧖 𗧗 𗧘	A

Group	Count	Tangut ideographs	Type
21	35	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀	B
22	3	𗀀𗀀𗀀(𗀀)	B
23	5	𗀀𗀀𗀀𗀀𗀀	B
24	9	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀	B
25	6	𗀀𗀀𗀀𗀀𗀀𗀀	B
26	3	𗀀𗀀𗀀	B
27	8	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀	B
28	10	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀	B
29	3	𗀀𗀀𗀀	B
30	2	𗀀𗀀	B
31	3	𗀀𗀀𗀀	B
32	5	𗀀𗀀𗀀𗀀𗀀	B
33	6	𗀀𗀀𗀀𗀀𗀀𗀀	B
34	3	𗀀𗀀𗀀	B
35	2	𗀀𗀀	B
36	11	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀	B
37	20	𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀𗀀(𗀀)	B

With only a handful of exceptions, ideographs in the same chain are all written with the same form of Component 316 (i.e. either all Type A or all Type B). Furthermore, the use of Type A or Type B is generally consistent for the same ideograph across multiple texts.
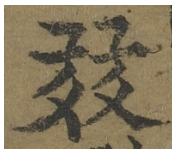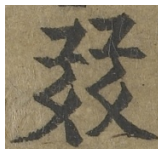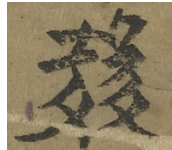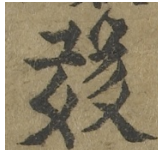
The difference between Type A and Type B forms of Component 316 can be very subtle when the component occurs in the middle of a character or on the right side of a character, as in these positions the extension of the third stroke of the Type A component may be restricted. Therefore, there are quite a few characters where it is not clear whether the component is Type A or Type B. Nevertheless, there are no obvious cases where all the sources for a given ideograph have Type A where Type B is expected, or *vice versa*.

The distinction between Type A and Type B components is also shown by the examples from a wider range of Tangut given in Section 6.3 "Evidence from Other Sources" Table B. As for Component 267, the Western Xia sources show the same distinction between Types A and B components as *Sea of Writing* and *Homophones*, with some exceptions (for example 17DB2 𗀀 has a Type B component in both *Sea of Writing* and *Homophones*, but is a very clear Type A

component in *Homonyms*, and both A and B glyph types are found in *Proverbs* and *Forest of Categories*). Again, the post-Western Xia sources are not as consistent in their treatment of Component 316, and in particular the Yuan dynasty edition of the *Avataṃsaka Sūtra* writes most Type B components as Type A. In interesting difference is that for 1813F 㲱, *Sea of Writing* and *Homophones* show both the left side and the right side components as Type B, whereas for the supplementary sources, the left side component is shown as Type B and the right side component is shown as Type A.

The two encoded ideographs 18139 㳔 and 18147 㳘 both incorporate Unicode Component 316 (𰀀), and each have two distinct meanings and readings. As shown in Table 11, one meaning of each pair is written with the Type A component, and the other meaning is written with the Type B component. A comparison of the glyph forms in *Homophones* [TY] for each of these pairs, showing this clear distinction, is given in Table 9.

Table 11: Ideographs which differ by Component 316 glyph type

Type A (𰀀)	Type B (𰀀)
18139 "to brush" L2008-1317 TY B2 19B37	18139 "to jump" L2008-1318 TY B2 52B44
18147 "negative prefix" L2008-1734 TY B2 16B26	18147 "respectful" L2008-1735 TY B2 26B64

3.4 Tangut Ideograph 175F6

The Tangut ideograph 175F6 㲟 has two meanings and two readings: "fox" [nə] and "tail" [ta]. In the 1997 edition of Li Fanwen's Tangut dictionary there are separate entries for the two meanings of this character, and the characters are distinguished by slightly different left side components: "fox" is written as ▢ 𰀀 𰀁 (Component 087); and "tail" is written as ▢ 𰀀 𰀁 (Component 113).

1841
00

羊它 fox

1666

狐也。（名）

羊它 称 də？ dʑĭʉ 1.28〔能"尼窄"〕沙

狐、野狐（同 19A7、珠 162）。

称 獵 羊它 称 散 縰 形 術 散 散　野狐者

野狐狸也，野獸名是也（雜 7.273）。

緦 靴 羊它 称 羆 鴕 靫 籬　豺狼狐狙雕

鶿之屬（九 288）。

〔舌頭音 ta 1.17 祕 餒 薉 都臘切 音

恒〕

羊它 tail

1667

①尾也。（名）

However, in the 2008 edition of Li Fanwen's dictionary the two characters are represented with exactly the same font glyph, with Component 087 on the left. On this basis the two entries for this character were unified, and only a single character encoded.

In Section 6.4 we provide glyph evidence from *Sea of Writing*, *Homophones* (Editions A and B), *Mixed Characters*, *Pearl in the Palm* for all 33 encoded ideographs that incorporate Component 087 (�). Using the character derivations provided in *Sea of Writing* and other Western Xia sources, it is possible to group these characters into five chains:

- Group 1: Chain of 5 characters related to the meaning "yak" (including 羊它 meaning "tail");
- Group 2: Chain of 3 characters related to the meaning "fox" (including 羊它 meaning "fox");
- Group 3: Chain of 18 characters related to the meaning "dog";
- Group 4: Chain of 4 characters related to the meaning "pig";
- Group 5: Chain of 4 characters related to the meaning "kind of grass".

In fact, it seems quite likely that at least the first four chains are related (the years of dog and pig are adjacent to each other, and the *Pearl in the Palm* lists "pig dog" as a vocabulary item), and should be sections of a single chain of derivation.

In the Tangut texts examined there appears to be no differentiation of Component 087 (犭) into two distinct glyph forms with separate semantics, as was the case for Components 267 and 316 discussed above. With a single exception, all examples of Component 087 in all texts are written using the same three-stroke form, and there is no obvious distinction between the glyphs for the two meanings of 175F6 㠭. The one exception is *Homophones* Edition A, where the two meanings of 175F6 㠭 are written quite distinctly, "fox" being written with an exaggerated three-stroke glyph form for Component 087 㠭 (with a very long first stroke not seen in other characters with Component 087), but "tail" being written with a two-stroke glyph form for Component 087 㠭 (with a very thick join between the strokes so that it could not be mistaken for a three-stroke form). This distinction seems to be quite deliberate, and intended to clearly distinguish "fox" and "tail" graphically. Table 12 shows the glyph forms of 175F6 in these and various other sources.

Table 12: Examples of Ideograph 175F6

"fox" [nə] L2008-1666	"tail" [ta] L2008-1667
Sea of Writing 3 7.273*	*Sea of Writing* 1 22.162
Homophones A 19A74	*Homophones* A 16B26
	Homophones A 15B48*
Homophones B2 20A16	*Homophones* B2 17A71
Homophones D 20A16	*Homophones* D 17A71

"fox" [nə] L2008-1666	"tail" [ta] L2008-1667
Synonyms 27A5.07 (in the word 豺狾 "jackal and fox")	*Synonyms* 16B3.06 (in the word 尾狾 "tail")
Homonyms 09A1 (homophone with 禰 [nwɪ])	*Homonyms* 11B5 (homophone with 羮 [ta])
Pearl in the Palm 162E (glossed as 沙狐 shāhú "sand fox")	
Mixed Characters 10A4 (in the word 狾狢 "fox")	
Grains of Gold 09A6 (in the word 狾狢 "fox")	
	Odes 4 01B1 (in the word 尾狾 "tail")

"fox" [nə] L2008-1666	"tail" [ta] L2008-1667
Forest of Categories 06.27B5 06.30B1 羅 猴 (in the word 羅猴 "fox")	

In addition to *Sea of Writing* and *Homophones*, there are only two other sources that feature both meanings of 175F6. One is the manuscript text of *Synonyms*, which appears to follow the distinction shown in *Homophones* Edition A. The other text is the xylograph edition of *Homonyms*, which also clearly distinguishes the glyphs for the two meanings, but the glyphs are the opposite way round than *Homophones* Edition A (which is probably a scribal mistake). 175F6 occurs only once in the *Odes*, where the meaning "tail" is written with the two-stroke form found in *Homophones* Edition A. The character occurs four times in *Forest of Categories* with the meaning "fox", but the evidence is confusing because two instances show the three-stroke form and two instances show the two-stroke form. All other sources we have examined show the meaning "fox" with the standard three-stroke form.

In summary, it seems from the available evidence that the two meanings of 175F6 are not distinguished in *Sea of Writing* or in *Homophones* Edition B, but they are distinguished in *Homophones* Edition A, *Synonyms*, and *Homonyms*. *Homophones* Edition A has a colophon dated 1132, and is one of the earliest surviving dated Tangut texts, so it is possible that initially there was a glyph distinction between "fox" and "tail", but this distinction was later lost. Although this distinction is not universal, we believe that it needs to be reflected in encoding.

3.5 Tangut Ideograph 17134

There are two separate entries for 17134 (㤖) in the *Homophones* Editions A and B, with different readings and meanings ("pair" and "foolish"). There are also two entries for 17134 in the *Synonyms* (㒼㤖 = *Tóngyì* 同義). However, there is no entry for either meaning of 17134 in the surviving parts of the *Sea of Writing*, and both meanings of the characters are not common, so do not occur together in any other source we know of. Below we give examples of the character meaning "pair" from *Sea of Writing*, *Forest of Categories* and *Dissected Rhymes of the Five Sounds*, but the only example of the character meaning "foolish" that we can find is from the *Combined Edition of Homophones and Sea of Writing*.

Table 13: Examples of Ideograph 17134

"pair, couple" [twe] L2008-3488	"foolish, stupid" [ngia] L2008-3489
Homophones A 18B75	*Homophones* A 21B14
Homophones B2 19B23	*Homophones* B2 22A63
Homophones D 19B23	*Homophones* D 22A63
Synonyms 21B7.04	*Synonyms* 30B4.07
	Combined Edition of Homophones and Sea of Writing A 08.022
Sea of Writing 1 42.161* *Sea of Writing* 1 61.142*	
Forest of Categories 06.04A7.15	

"pair, couple" [twe] L2008-3488	"foolish, stupid" [ngi̯a] L2008-3489
Dissected Rimes of the Five Sounds A 2a	

There are few sources that use 17134, and even fewer that use both meanings, so there is not much evidence to go on. At first sight, the above examples do not seem to show any obvious glyph distinction, and in particular both meanings of 17134 incorporate the same three-stroke form of Component 068 (�). However, there does appear to be a distinction in the glyphs for *Homophones* Edition A only, where the right side of the glyph for "pair, couple" shows Component 027 (⼃) and Component 068 (�) forming a single unitary component (𱿤), whereas the right side of the glyph for "foolish, stupid" looks like two separate components, with Component 027 (⼃) above and extending to the right of a shorter Component 068 (�).

That the difference shown by *Homophones* Edition A is significant, and is not just a random variation in handwriting is confirmed from the derivations for the two meanings of 17134. According to the *Combined Edition of Homophones and Sea of Writing*, the character with the meaning "foolish" derives from the left side and middle-top of 1714D 𬵆 [lị] "ignorant" (i.e. ⼁ and ⼃) and the right side of 17B69 𬸢 [weị] "foolish" (i.e �), which means that in this case the right side component is constructed separately from Component 027 (⼃) above and Component 068 (�) below. On the other hand, the character with the meaning "pair" is related to the ideograph 180B0 𘂰 "twin", and Component 287 in both characters can be presumed to derive from 180AA 𘂪 [ndzın] "one".

In the 2016 draft of *Table of Xixia Characters with Annotated Properties* (西夏字符及属性标注表), this difference in character construction is indicated, but is not reflected in the glyph forms. The glyph for "foolish" uses a three-stroke form of Component 068, whereas the glyph for "pair" possibly uses a two-stroke form of Component 068, although both characters are assigned the same stroke count.

Table of Xixia Characters with Annotated Properties (Zhonghua ziku... 2016) p. 14

| 0276 | 𬵍 | | twee 2.11 [对] | 对⊗ | □ | ⼁ | 𱿤 | 7 | 同丁 19B23，同甲 18B75，义 2127.04 |
| 0277 | 𬵍 | | gjaa 2.21 [业] | 笨、愚 | □ | ⼁⼃ | 𰁿 | 7 | 同丁 22A63，同甲 21B14，义 3024.07 |

We think that that the correct glyph distinction for the two meanings of 17134 is the size and positioning of Component 068 (㇟) with respect to Component 027 (丶), as shown in *Homophones* Edition A:

"pair, couple" [twe] L2008-3488	"foolish, stupid" [ngi̯a] L2008-3489
Homophones A 18B75	*Homophones* A 21B14

We have seen above that *Homophones* Edition A preserves a glyph distinction between the two meanings of 175F6 ("fox" and "tail") that was lost in the B editions of *Homophones*, so it is plausible that in the case of 17134 *Homophones* Edition A preserves a distinction that was lost in the B editions, especially as this distinction matches the different character derivations. We consider that the distinction shown in the *Homophones* A edition should be reflected in encoding.

3.6 Tangut Ideograph 17E08

There are two entries in *Homophones* Edition B for Tangut Ideograph 17E08 (䄂), one entry with the meaning of "to squeeze [lice to death]" with reconstructed reading djwu (TY A 17A15; TY B 17B55), and one entry with reconstructed reading djwi which is used as a transliteration character (TY B 20B64). The glyph forms of the character appear to be identical in all cases, with the same three-stroke form of Component 068 (㇟) in the middle.

Under the entry in *Homophones* Edition B for the meaning it is noted: 𗰗𗤁𗢺𗿢 "one character, two names" (i.e. two readings). This is the only entry in *Homophones* to have a notation like this. The *Sea of Writing* (I 09.243) only has a single entry for this character, but it gives both the meaning of "to squeeze (lice)" with the *fǎnqiè* gloss 𗤒/𗤁 dji/ljwu (=djwu), and the transliteration with the *fǎnqiè* gloss 𗢦/𗥾 djwu/ljwi (=djwi), along with a note very similar to that in the *Homophones*: 䄂𗤘𗢺𗿢𗰔 "[Character] 䄂 has two names (i.e. readings) attached to it". Given that the phonetic values of the two meanings of this character are very close, and two sources explicitly note that the character has two readings, it seems likely that the two entries are slightly different phonetic reflexes of the same character. Perhaps the pronunciations of the meaning "to press" and its transliteration pronunciation had diverged over time. The fact that *Homophones* Edition A does not have an entry for the use as a transliteration character suggests that the A edition may represent an early stage in the language, before 17E08 had acquired two readings.
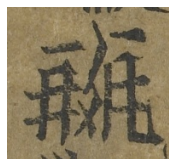
Homophones B2 17B55	*Homophones* B2 20B64	*Sea of Writing* 1 09.243
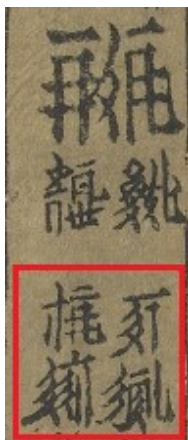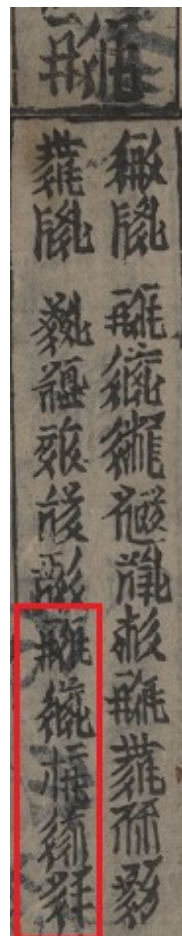
The graphic form of the character in the two entries of *Homophones* is identical, and there is no evidence from other sources that there is any graphic distinction between the two meanings. Therefore, there is no justification for disunifying 17E08.

4. Conclusion and Recommendations

4.1 Conclusion

Our investigation shows that:

- Tangut Component 267 actually corresponds to two graphically similar but unrelated components (彳 and 彳) which differ by glyph construction and stroke count.
- Tangut Component 316 actually corresponds to two graphically similar but unrelated components (乥 and 乥) which differ by glyph construction and stroke count.
- Tangut Components 068 仝, 141 彳 and 278 乄 also each correspond to two graphically similar but unrelated components.
- The five encoded Tangut ideographs 17F0D 縱, 17F8A 縱, 17FA5 縱, 184F1 縱, and 18736 縱 each correspond to two semantically and phonetically distinct characters which are non-cognate and are consistently differentiated at the glyph level by the use of 彳 or 彳 for Component 267 (the five bird-related meanings have 彳, whereas the five meanings unrelated to birds have 彳).
- The two encoded Tangut ideographs 18139 縱 and 18147 縱 both correspond to two semantically and phonetically distinct characters which are non-cognate and are consistently differentiated at the glyph level by the use of 乥 or 乥 for Component 316.
- The encoded ideograph 175F6 縱 corresponds to two semantically and phonetically distinct characters which are non-cognate, and which are distinguished at the glyph level in some sources, including *Homophones* Edition A.
- The encoded ideograph 17134 縱 corresponds to two semantically and phonetically distinct characters which are non-cognate and which are distinguished at the glyph level in *Homophones* Edition A.
- The encoded ideograph 17E08 縱 corresponds to two semantically and phonetically distinct characters which are cognate and are not differentiated at the glyph level.
- The encoded ideographs 182F5 縱 and 180D6 縱 should have the same left side component (Component 412: 乥), but are differentiated by the middle component (彳 for 182F5, and 彳 for 180D6).

We conclude that the following seven Tangut ideographs should be disunified, as Jia and Jing suggested at the Yinchuan meeting in 2016:

- 17F0D 縱 ⇒ 縱 (source ref. L2008-3435) and 縱 (source ref. L2008-3436)
- 17F8A 縱 ⇒ 縱 (source ref. L2008-2252) and 縱 (source ref. L2008-2253)
- 17FA5 縱 ⇒ 縱 (source ref. L2008-3684) and 縱 (source ref. L2008-3683)
- 18139 縱 ⇒ 縱 (source ref. L2008-1317) and 縱 (source ref. L2008-1318)
- 18147 縱 ⇒ 縱 (source ref. L2008-1734) and 縱 (source ref. L2008-1735)

- 184F1 𘓱 ⇒ 𘓱 (source ref. L2008-1106) and 𘓱 (source ref. L2008-1107)

- 18736 𘜶 ⇒ 𘜶 (source ref. L2008-4456) and 𘜶 (source ref. L2008-4457)

We think that the following two Tangut ideographs should also be disunified, pending agreement from other Tangut experts, as in both cases the glyph forms are distiguished in the important A edition of *Homophones*:

- 17134 𗄴 ⇒ 𗄴 (source ref. L2008-3488) and 𗄴 (source ref. L2008-3489)

- 175F6 𗗶 ⇒ 𗗶 (source ref. L2008-1666) and 𗗶 (source ref. L2008-1667)

4.2 Solution

Two possible solutions were mentioned at the Yinchuan meeting in 2016:

A. For each character requiring disunification, encode one new character to represent one of its meanings and glyph forms.
B. Define two variation sequences for each character with two glyph forms, one variation sequence for the Type A glyph and one variation sequence for the Type B glyph.

Variation sequences "provide a mechanism for specifying variants … that have essentially the same semantics but substantially different ranges of glyphs" (*The Unicode Standard* version 11.0.0 p. 872), but are not an appropriate option in cases where the two glyph forms of each character are both visually and semantically distinct from each other. We believe we have demonstrated in this document that the glyph differences are semantic, and as the different forms of each encoded character are constructed from different source characters the two forms of each encoded character are also non-cognate. We strongly support applying the criterion for disunification defined for CJKV ideographs in the *IRG Principles and Procedures* version 11 (http://appsrv.cse.cuhk.edu.hk/~irg/irg/irg50/IRGN2310SC2N4611WG2N4979IRGPnP11.pdf) Section 2.1.3 "Non-cognate Rule" (emphasis added):

> Ideographs with different glyph shapes that are unrelated in historical derivation (non-cognate characters) are not unified **no matter how similar their glyph shapes may be**.

If we apply this rule to Tangut encoding then it necessary to disunify each existing character under consideration to two separate code points rather than define variations sequences for each single code point.

4.3 Costs and Benefits of Disunification

A. Costs

- Existing Unicode data containing the disunified characters will need to be evaluated, and if necessary new code points will need to be substituted for any existing code points for disunified characters with the meaning corresponding to the new characters.
- Unicode Tangut fonts will need to be updated to include the new characters.
- Applications that use the Unicode Tangut data will need to be updated for the new data file (which should in most cases be done automatically for each new version of the standard any way).

B. Benefits

- Users will be able differentiate the two meanings of each disunified character in search operations and textual analysis.
- There will be better mapping between the UCS and Mojikyō and other legacy character sets (which assign two different code points to the disunified characters).
- The UCS will more correctly reflect Tangut orthography.
- The improvement in the UCS representation of Tangut characters will likely increase the uptake in Unicode Tangut by users.

The main cost of disunification is the effect it may have on existing Unicode Tangut data, but this can be considerably reduced by keeping the most frequently-occurring meaning of each disunified pair of meanings at the original code point, and encoding the least common meaning of each pair at a new code point. Doing this would mean that existing Unicode text containing only the most common meanings of the disunified characters will not be affected by the disunifications.

The costs of disunification are further mitigated by the fact that adoption of Unicode Tangut by scholars working in the field is still very limited, and there are not many large databases or collections of Tangut data or texts in Unicode encoding. Moreover, the few users who do have large collections of Unicode Tangut data and text, such as Andrew West, are quite capable of applying the disunifications to their data and texts.

The limited adoption of Unicode Tangut to date is evidenced by the special Tangut issue of the *Journal of Chinese Writing Systems* (vol. 2 issue 3) [https://journals.sagepub.com/toc/cwsa/2/3] which was published in September 2018. This issue comprises eight papers that incorporate Tangut text, of which the six papers by mainland China scholars use a legacy CJK hack encoding for Tangut text, and only the two papers by Andrew West (UK) and Tai Chung-pui (Hong Kong, China) use Unicode Tangut.

These factors suggest that the benefits of disunification outweigh the costs, and in order to minimise any disruption and inconvenience to Tangut users, the disunifications should be made as soon as possible.

4.4 Recommendations

We recommend making the following changes:

- Encode five new Tangut components at 18AFA..18AFE as disunified forms of Tangut Components 068 (彳), 141 (彳), 267 (彳), 278 (彳) and 316 (彐).
- Encode seven new Tangut ideographs at 187F8..187FE as disunified forms of Tangut Ideographs 175F6 (虺), 17F0D (虺), 17F8A (虺), 17FA5 (虺), 18139 (虺), 18147 (虺), 184F1 (虺), 18736 (虺).
- Consider encoding two new Tangut ideographs as disunified forms of Tangut Ideographs 17134 (虺) and 175F6 (虺).
- Modify the glyph and radical for 180D6 (虺).
- The Tangut data file should be expanded to include a new key which gives the radical number and total stroke count for all encoded Tangut ideographs listed in Jia and Jing's *Table of Xixia Characters with Annotated Properties* (西夏字符及属性标注表) or other suitable document. The existing kRSTUnicode key should not be changed as it reflects the system used to order the set of Tangut ideographs. Users can decide to use either the original kRSTUnicode key or the new key for sorting and other purposes.
- A new Tangut font which reflects Jia and Jing's analysis of the structure of Tangut components and ideographs should be provided for the code charts. This could be a modification of the existing font or a completely new font provided by China.

The new Tangut ideographs and components should be encoded at the earliest opportunity, but the new font and additional data are not so urgent. The font and data can be prepared while the encoding process is ongoing, with the aim of being ready for the versions of Unicode and ISO/IEC 10646 that includes the new characters, but this is not essential.

The proposed character additions are shown in Table 14, and changes to existing characters are summarized in Table 15. There are three points that should be noted:

- As discussed above, disunification is least disruptive if the most common meaning of each disunified character remains with the existing character, and the new character is assigned to the less common meaning. It turns out that for the five ideographs with Component 267, in each case the meaning with the Type A glyph is less common, and so proposed to be assigned to a new code point. For the two ideographs with Component 316, in both cases the meaning with the Type B glyph is less common, and so proposed to be assigned to a new code point. For 17134 the meaning "pair" is more common than the meaning "foolish", and for 175F6 the meaning "fox" is more common than the meaning "tail", and so the meanings "foolish" and "tail" are proposed to be assigned to new code point.
- The proposed radical and stroke count values for the new disunified ideographs are the same as for the corresponding existing ideographs. This is because they are intended to reflect the current system of radicals and method for counting strokes, so as to be consistent with all other encoded Tangut ideographs. New radical assignments and stroke counts for these

characters should be part of the new radical/stroke data to be added as a new key to the Tangut data file.

- The source references for the disunified ideographs need to be divided into two, and one part assigned to the corresponding new code point.

Table 14: Proposed Character Additions

C/P	Glyph	Source Reference or Character Name	Radical/ Strokes	Notes
187F8	縦	L2008-3435	262.10	Type A glyph meaning "god" Disunified from 17F0D
187F9	叔	L2008-2252	267.9	Type A glyph meaning "kind of bird" Disunified from 17F8A
187FA	緻	L2008-3684	267.11	Type A glyph meaning "kind of bird" Disunified from 17FA5
187FB	弦	L2008-1318	316.10	Type B glyph meaning "to jump" Disunified from 18139
187FC	弦	L2008-1735	316.11	Type B glyph meaning "respectful" Disunified from 18147
187FD	厰	L2008-1106	485.12	Type A glyph meaning "swallow" Disunified from 184F1
187FE	嶽	L2008-4456	674.14	Type A glyph meaning "wild goose" Disunified from 18736
XXXXX	股	L2008-3489	17.7	Glyph meaning "foolish, stupid" Disunified from 17131
XXXXX	死	L2008-1667	87.9	Glyph meaning "tail, east" Disunified from 175F6
18AFA	乆	TANGUT COMPONENT-763		Type B glyph corresponding to Component 068 (18843)
18AFB	夂	TANGUT COMPONENT-764		Type B glyph corresponding to Component 141 (1888C)
18AFC	夆	TANGUT COMPONENT-765		Type B glyph corresponding to Component 267 (1890A)
18AFD	亥	TANGUT COMPONENT-766		Type B glyph corresponding to Component 278 (18915)
18AFE	弓	TANGUT COMPONENT-767		Type B glyph corresponding to Component 316 (1893B)

Table 15: Proposed Changes to Existing Characters

C/P	Glyph	Source Reference	Radical/ Strokes	Notes
17134	㑊	~~L2008-3488-3489~~ L2008-3488	17.7	Glyph meaning "pair" Disunified form at XXXXX
175F6	㦲	~~L2008-1666-1667~~ L2008-1666	87.9	Glyph meaning "fox" Disunified form at XXXXX
17F0D	㳡	~~L2008-3435-3436~~ L2008-3436	262.10	Type B glyph meaning "very close relative" Type A glyph form at 187F8
17F8A	㳨	~~L2008-2252-2253~~ L2008-2253	267.9	Type B glyph meaning "warehouse" Type A glyph form at 187F9
17FA5	㴡	~~L2008-3683-3684~~ L2008-3683	267.11	Type B glyph meaning "day after tomorrow" Type A glyph form at 187FA
180D6	㵣	L2008-5191	~~301.13~~ 412.13	Glyph and radical change
18139	㶅	~~L2008-1317-1318~~ L2008-1317	316.10	Type A glyph meaning "to brush" Type B glyph form at 187FB
18147	㶆	~~L2008-1734-1735~~ L2008-1734	316.11	Type A glyph meaning "negative prefix" Type B glyph form at 187FC
184F1	㷭	~~L2008-1106-1107~~ L2008-1107	485.12	Type B glyph meaning "heaven" Type A glyph form at 187FD
18736	㻲	~~L2008-4456-4457~~ L2008-4457	674.14	Type B glyph meaning "big" Type A glyph form at 187FE

Notes

1. For each disunified character, one glyph form is essentially the same as for the existing glyph. However, in order to more clearly distinguish the disunified glyph forms, the existing glyph may be slightly modified so as to accentuate the difference between disjoined and joined components (e.g. for 175F6 the tip of the first stroke has been elongated).

2. If it is agreed to disunify 17134 and 175F6, it will be necessary to create a new Tangut Extended block. It is anticipated that in the future there will be occasional proposals to encode a small number of additional Tangut ideographs, but as minor glyph variations should be dealt with by means of Ideographic Variation Sequences, we think that an additional block of 64 code points should be sufficient for Tangut encoding needs for the foreseeable future. Therefore we suggest allocating a Tangut Extended block at 18D00..18D3F.

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Note on *Homophones (Tongyin)* editions

There are two xylographic editions of *Homophones*, A and B. Edition A is only preserved as a single copy at the Institute of Oriental Manuscripts and a single small fragment at the British Library, but there are several different exemplars of Edition B printed from the same or different woodblocks (i.e. original or recarved woodblocks for the same edition). However, Chinese researchers divide *Homophones* into four editions, A, B, C and D (Chinese 甲種本, 乙種本, 丙種本, 丁種本), where Chinese Edition A corresponds to actual Edition A, and Chinese Editions B, C and D are different exemplars of actual Edition B (see ECHW 7). In our previous technical documents on encoding of Tangut script prepared for UTC and WG2 in 2008–2018, for compatibility with the Chinese scheme we referred to the exemplars of Edition B as Editions B, C and D. As the Chinese Edition B is actually a composite of three different exemplars (with different inventory numbers), we specified the exemplars corresponding to Chinese Edition B as B1, B2 and B3. In this document we use a less confusing and more logical scheme of reference, with different exemplars of Edition B referred to as B1 (previously B1), B2 (previously B2), B3 (previously B3), B4 (previously C), B5 (previously D) etc.

Note on Tangut readings

Tangut readings in this document are M. V. Sofronov's reconstructed pronunciations as given in E. I. Kychanov's Tangut dictionary (Kychanov 2006). Where there is no reading for a particular character in Kychanov's dictionary, we use the reading given in Sofronov 1968 if available, with the transcription modified to match the usage in Kychanov 2006.

6. Appendix: Evidence for Glyph Forms

The tables below list all Tangut ideographs that belong to the same chain of derivation. The main source for derivation is the *Sea of Writing*, but if there is no entry for an ideograph in the *Sea of Writing* then the derivation given in either the *Combined Edition of Homophones and Sea of Writing* or the *Precious Rimes of the Sea of Writing* is used instead if available. For quite a few ideographs there is no surviving entry in any of these sources, and so no derivation is available. However, in some of these cases we can make a reasonable guess at the character derivation, in which case our proposed derivation is put in square brackets.

Key to Columns:

C/P. Unicode code point.

Glyph. Glyph using the Tangut Yinchuan font.

WH. Image of the character in the *Sea of Writing*. Where possible this is the image of the head entry for the character. If the image is not from the head entry then the reference is marked with an asterisk.

TY A / B. Image of the character in *Homophones* Edition A and/or Edition B. If the image is from a gloss because there is no surviving head entry then the reference is marked with an asterisk.

ZZ. Image of the character in *Mixed Characters* (black and white images from Nakajima et al. 1997; greyscale images from Terentiev-Katansky et al. 2002; and colour images from the British Library fragments).

ZZZ. Image of the character in *Pearl in the Palm*.

Refs. Reference for *Sea of Writing* (WH), *Homophones* (TY), *Combined Edition of Homophones and Sea of Writing* (TYWH), and *Precious Rimes of the Sea of Writing* (WHBY). References for *Mixed Characters* and *Pearl in the Palm* are omitted as each character may occur in multiple places for these two texts.

Meaning. The simple English definition for the character in Li Fanwen's 2008 *Tangut-Chinese Dictionary*; and M. V. Sofronov's reconstructed pronunciation of the character as given in E. I. Kychanov's 2006 Tangut dictionary.

Parent. The code point and glyph of the parent character which is the source for the component (267 or 316).
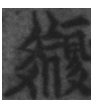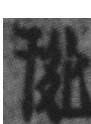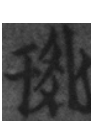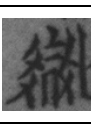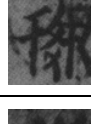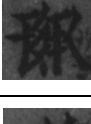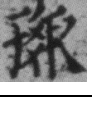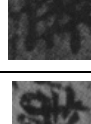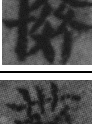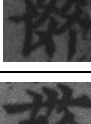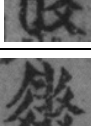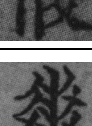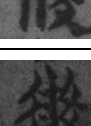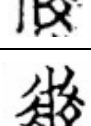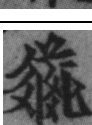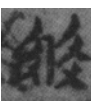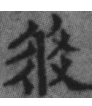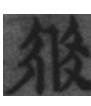
Type. The glyph type of the component: A, B, or A/B (where different sources show different glyph types). Where a character includes the component in two places, the type for each occurrence of the component is given, with "l", "m" or "r" in parentheses to indicate the left, middle or right position respectively.

6.1 Evidence for Component 267

6.1.1   Ideographs with Component 267 Type A

Groups 1 through 18 have Type A Component 267 (犭), i.e. written with five strokes.

Group 1: Chain of 54 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FFC	�						WH 3 7.251 TY B2 38A75	bird [ndźiwon]	17FE4	A
17036							TY A 12A47 TY B2 13A38 TYWH-A 06.063	a kind of bird [thon]	17FFC	A
17343							WH 1 23.262* TY A 41B51 TY B2 42A72 WHY 78.75	a place name [·i̯eɯ]	17FFC	A
17FF5							WH 1 23.262 TY A 42A63 TY B2 43A14	a surname [·a]	17343	A
17358							WH 1 27.241 TY A 05A63 TY B5 06A54	butterfly [pa]	17FFC	A
1735C							WH 1 27.242 TY A 05A64 TY B5 06A55	broad [pa]	17358	A
176A6							WH 1 8.211 TY A 15A52 TY B2 16A38	turtledove [ti̯u]	17FFC	A
17A40							WH 1 92.151 TY A 23B27 TY B2 24A78	a kind of bird [kwi̯e]	17FFC	A
17AC2							WH 1 28.212 TY A 13A45 TY B2 14A27	an affix [ta]	17FFC	A
17B74							WH 1 62.162 TY A 44B74 TY B2 45A62	a surname [·i̯on]	17FFC	A
17F0D							WH 1 10.253 TY A 41B26 TY B2 42A46	god [·u]	17FFC	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F8B							WH 1 71.212 TY A 19A75 TY B2 20A17	bird excrement [tẹi]	17FFC	A
17F8C							WH 1 79.151 TY A 10B41 TY B2 11B42	a kind of bird [wại]	17FFC	A
17F8E							WH 1 18.172 TY A 24B62 TY B2 25B38	a kind of bird [kwi]	17FFC	A
17F8F							WH 1 82.212 TY A 10A58 TY B2 11A58	crane [wẹ]	17FFC	A
17F9B							TY A 12A67 TY B2 13A58 TYWH-A 06.112	to fall [nịu]	17FFC	A
17FA1							WH 1 91.171 TY A 07B22 TY B2 08A58	bee [mbụo]	17FFC	A
17096							WH 1 91.162 TY A 07B24 TY B2 08A62	bag [mbụo]	17FA1	A
17FF4							WH 1 91.172 TY A 07B23 TY B2 08A61	nipple [mbụo]	17FA1	A
17CA2							WH 1 63.262 TY A 49A58 (TY B2 49B55)	insect [lụ]	17FA1	A
17FA3							WH 3 14.111 TY A 29A27 TY B2 29B65	extremely high [ndzịẹi]	17FFC	A
17FA5							WH 1 21.112* TY A 39A51 TY B2 39B36 TYWH-A 18.084	a kind of bird [świ]	17FFC	A
17FC3							WH 1 74.231 TY A 19B67 TY B2 20A75	pretty [ndẹ]	17FFC	A
17FC7							WH 1 90.231 TY A 23A44 (TY B2 24A27)	egret [kẹɯ]	17FFC	A
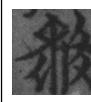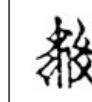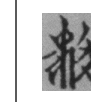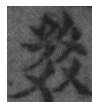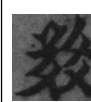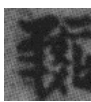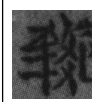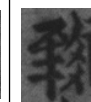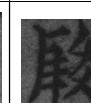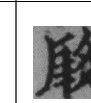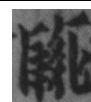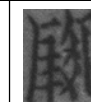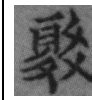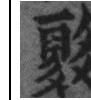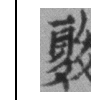
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FCB	𗿋				𗿋		WH 1 66.242* TY A 09A44 TY B3 07A32 TYWH-B 02 下 21	to brood [mbo]	17FFC 𗿬	A
17FCC	𗿌				𗿌		WH 1 45.171 TY A 35B77 TY B2 36B43	a kind of bird [tśi̯ei]	17FFC 𗿬	A
17FCD	𗿍				𗿍		WH 1 29.222 TY A 38B56 (TY B2 41B73)	a kind of bird [śi̯a]	17FFC 𗿬	A
17FD1	𗿑				𗿑	𗿑	WH 1 88.122 TY A 45B38 TY B2 46A31	a surname [xwə]	17FFC 𗿬	A
17FD3	𗿓				𗿓		WH 3 12.132	an insect name [lhə]	17FFC 𗿬	A
17FD8	𗿘				𗿘		WH 1 39.121 TY A 32B43 TY B2 33A55	a kind of bird [tshɿ]	17FFC 𗿬	A
17FB2	𗾲					𗾲	WH 1 39.112 TY A 32B44 TY B2 33A53	name of a star [tshɿ]	17FD8 𗿘	A
17FD4	𗿔				𗿔		TY A 25A46 TY B2 26A22	a kind of bird [ngwe]	17FFC 𗿬	A
17FDB	𗿛				𗿛	𗿛	WH 1 31.111 TY A 07A75 TY B2 08A43	goose [mban]	17FFC 𗿬	A
17FD6	𗿖				𗿖	𗿖	WH 1 31.111* TY A 28A68 TY B2 28B75 TYWH-A 15.082	goose [ngâɯ]	17FDB 𗿛	A
17FDD	𗿝				𗿝	𗿝	WH 3 4.122 TY A 30B74 TY B2 31B33	wild goose [ndze]	17FFC 𗿬	A
17FE1	𗿡						WH 1 20.253 TY A 11A15 TY B2 12A16	a place name [wen]	17FFC 𗿬	A
17FE4	𗿤						WH 3 7.252 TY B2 38A76	breeding [ndźi̯won]	17FFC 𗿬	A
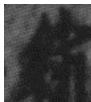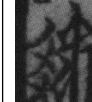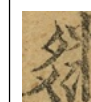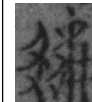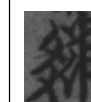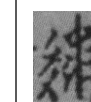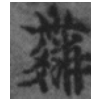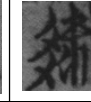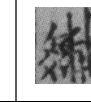
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FE6	幾				幾		WH 1 28.121 TY A 03A32 TY B1 04A27	female [ma]	left: 17FE4 纖 right: 184F1 敝	A (l) A (r)
17FE8	纕				纕		WH 1 51.142 TY A 26B25 TY B2 27A56	a kind of bird [kwai]	17FFC 纊	A
17FEB 17FEC	纋 纋				纋		WH 1 39.251 TY A 25B25 TY B2 26A66	turtledove [kwɿ]	17FFC 纊	A
17FED	纙				纙		WH 1 42.131 TY A 04B38 TY B5 05B34	a kind of bird [mi̯ə]	17FFC 纊	A
177C8	蘳						TY A 04B42 TY B5 05B41	a kind of tree [mi̯ə]	[17FED] [纙]	A
17FF6	纖				纖		WH 1 65.271 TY A 52B48	crow [lại]	17FFC 纊	A
17FFB	纖				纖	纖	WH 1 10.222 TY A 24B32 TY B2 25A77	phoenix [ku]	left: 17FFC 纊 middle: 18736 敝	A (l) B (m)
17565	聂				聂	聂	WH 3 12.112* TY A 05B31 TY B5 06B17 WHBY 67.46	shining [mbi̯e]	17FFC 纊	A
18009	詼				詼		WH 1 54.271 TY A 47B68 TY B2 48A57	bird [źi̯eɯ]	17FFC 纊	A
18011	詼				詼		WH 1 5.132 TY A 04B64 TY B5 05B57	a kind of bird [pu]	17FFC 纊	A
17EC8	詼				詼		WH 1 5.142 TY A 04B65 TY B5 05B58	barnyard grass [pu]	18011 詼	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18095	粼						WH 1 22.172 TY A 16B28 TY B2 17A74	swallow [ta]	17FFC 纆	A
180CF	焱						TY A 06A41 TY B3 07A25 TYWH-B 03 上 42	a kind of bird [pi̯a]	17FFC 纆	A
181EA	毿						WH 1 9.212* TY A 07A24 TY B2 10A25 WHBY 80.25 TYWH-A 01.123	a surname [mbô]	17FFC 纆	A
18240	骰						WH 1 92.211 TY A 32A11 TY B2 32B31	government official [tsɿ]	17FFC 纆	A
18242	鼬						WH 3 5.251 TY A 34A71 TY B2 34B67	moat [ndzi̯e]	18240 骰	A
18740	敠						WH 1 19.242 TY A 07B75 TY B2 08B34	to fly [phi̯e]	17FFC 纆	A

Group 2: Chain of 6 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F99	緕						WH 1 22.172* TY A 53A73 TY B6 53B34	little bird [leɯ]		A
17FB6	緔						WH 1 9.222 TY A 45A18 TY B2 45A72	void [xi̯u]	17F99 緕	A
1778A	蕍						WH 1 11.111 TY A 09A37 TY B2 08B76	replete [pu]	17FB6 緔	A
17FA9	緤						TY A 46A24 TY B2 46B13	county [xi̯wan]	17FB6 緔	A
17FDA	緕						TY A 46A25 TY B2 46B14	a transliteration [xâɯ]	17FB6 緔	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F97	𗾗						TY A 46A37 TY B2 45B22	a transliteration [na]	[17FB6] [𗾶]	A

Group 3: Chain of 8 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
184F1	𘓱						TY A 04A36 TY B5 05A28	swallow [me]		A
17FAC	𗾬						WH 1 90.222* TY A 42A42 TY B2 42B63	cuckoo [·i̯ew]		A
17FE6	𗿦						WH 1 28.121 TY A 03A32 TY B1 04A27	female [ma]	right: 184F1 𘓱 left: 17FE4 𗿤	A (l) A (r)
17F95	𗾕						TY A 46B34 TY B2 47A48 TYWH-A 23.112	swallow [ri̯e]	left: 17FAC 𗾬 right: 184F1 𘓱	A (l) A (r)
17FFD	𗿽						WH 1 28.122 TY A 03A38 TY B1 04A28	a kind of bird [ma]	17FE6 𗿦	A
17FE5	𗿥						WH 1 75.212 TY A 10B61 TY B2 11B58	old [vi̯ə]	17FE6 𗿦	A
185C9	𘗉						WH 3 20.251 TY A 55B71	a transliteration [lwan]	17FE6 𗿦	A
17B60	𗭠						TY A 28B31 TY B2 29A35	a transliteration [khan]	[185C9] [𘗉]	A

Group 4: Chain of 4 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FB7	𗾷				𗾷	𗾷	WH 1 12.272* TY A 35B68 TY B2 36B26	owlet [ndźie]		A
17F87	𗾇						WH 1 12.272 TY A 07A78 TY B2 08A46	demented [mbe]	17FB7 𗾷	A
17FB8	𗾸						WH 1 13.111 TY A 07B11 TY B2 08A47	disease [mbe]	17F87 𗾇	A
176AA	𗚪						WH 1 12.271 TY A 07A77 TY B2 08A45	to dispatch [mbe]	17F87 𗾇	A

Group 5: Chain of 2 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1702A	𗀪				𗀪	𗀪	WH 1 90.172* TY A 52B35 TY B1 53A11	peacock [lde]		A
1701D	𗀝				𗀝	𗀝	WH 1 90.251 TY A 11B23 TY B2 12B22	chicken [wụo]	1702A 𗀪	A

Group 6: Chain of 2 characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1751F	𗔟						WH 3 2.111 TY A 20A22 TY B2 21A13	a surname [?]	1837F 𘍿	A
1837F	𘍿				𘍿		WH 3 2.112 TY A 20A23 TY B2 21A14	hawk [?]	1751F 𗔟	A

Group 7: Chain of 7 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18533	𘔳				𘔳	𘔳	WH 1 53.242 TY A 55A73	gas [lweɯ]	𘔳	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FC9	𗿉				𗿉	𗿉	WH 1 9.223 TY A 41B64 TY B2 42B16	smoke [·i̯u]	𗿉	A
177A6	𗞦						WH 1 81.131 TY A 22B54 TY B2 23B37	to smoke (meat) [ki̯u]	𗿉	A
17FFA	𗿺						WH 1 12.151 TY A 12A74 TY B2 20B11	to smoke out [ndi̯u]	𗿉	A
1728C	𗊌						WH 1 8.243 TY A 12A72 TY B2 17A27	sweat [ni̯u]	𗿉	A
17FA6	𗾦						WH 1 57.251 TY B2 38B21	confused [tśi̯o]	𗊌	A
17FCE	𗿎						WH 1 57.251* TY A 48A62 TY B2 48B55	confused [leɯ]	[𗾦]	A

Group 8: Chain of 5 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FC4	𗿄					𗿄	WH 1 9.231* TY A 26A16 TY B2 26B52 TYWH-A 10.022	to request [khi̯u]	17FA4 𗾤	A
17FB5	𗾵				𗾵		WH 1 34.151* TY A 26A15 TY B2 26B53 TYWH-A 10.031	minced meat [khi̯u]	17FC4 𗿄	A
17FA4	𗾤						WH 1 9.231 TY A 41B65 TY B2 42B17	to ask [·i̯u]	17FC4 𗿄	A
17FC1	𗿁						WH 1 37.213 TY A 06B54 TY B2 07B31	to hear [phɿ]	17FA4 𗾤	A
17FD9	𗿙						TY A 26A17 TY B2 26B54 TYWH-A 10.032	imperial edict [khi̯u]	17FA4 𗾤	A

Group 9: Chain of 8 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18324	粷						WH 1 76.212 TY A 16B47 TY B2 17B21	strip [ndi̯ə]	181ED 祕	A
181ED	祕						WH 1 18.252 TY A 30A73 TY B2 31A35	to tie [si̯wi]	18324 粷	A
1731C	黻						WH 1 93.111 TY A 18A72 TY B2 19A23	water, dew [ni̯o]	18324 粷	B
1774A	蕤						WH 1 18.251 TY A 30A72 TY B2 31A34	roof beam [swi]	181ED 祕	A
17585	諃						WH 1 28.231* TY A 30A74 TY B2 31A38 WHBY 66.73	to go along with [swi]	181ED 祕	A/B
17C62	羬						WH 1 28.231 TY A 16B74 TY B2 20B36	an auxiliary word [na]	17585 諃	A
17AB2	纞						WH 1 54.261 TY A 45A77 TY B2 45B73	to summon (for surrender) [·i̯eɯ]	17C62 羬	A
1798B	緂						TY A 17B23 TY B2 18A56 WHBY 74.31	carriage [nei]	17585 諃	A

Group 10: Chain of 9 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
185F4	爻						WH 3 7.242* TY A 26A12 TY B2 26B48 TYWH-A 10.012	waist [ki̯e]	17F86 爻	A
17F86 170D0	爻 爻						WH 3 7.242 TY B2 38A65	waist [ndźi̯eɯ]	185F4 爻	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F9D	𗾝						WH 1 55.142 TY A 55A62	to hang [źi̯əɯ]	17F86 炙	A
17FB1	𗾱						WH 3 14.121* TY A 16A36 TY B2 14B37 WHBY 75.69	weapon [nɪn]	17F9D 𗾝	A
175F9	𗗹						WH 3 18.232* TY A 40A47 TY B2 40B27	bellyband [śi̯wa]	[185F4] [炙]	A
1854E	𘕎						WH 1 63.261* TY A 16A37 TY B2 17A15 WHBY 76.51	to listen [nɪn]	175F9 𗗹	A
185F7	𘗷						WH 1 36.121 TY A 20A51 TY B2 21A41	skirt [ni̯ə]	185F4 炙	A
17C61	𗱡						WH 1 15.271* TY B6 54A55	a surname [źi̯wu]	[185F4] [炙]	A
18314	𘌔						TY A 48A74 TY B2 48B65	white [rẹ]	[185F4] [炙]	A

Group 11: Chain of 5 characters
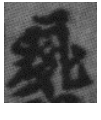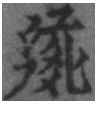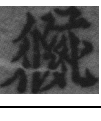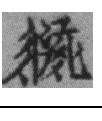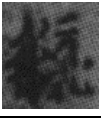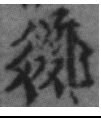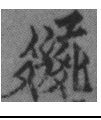
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
185F6	𘗶						WH 1 47.232* TY A 53B27 TY B6 53B63	horse [ri̯ạ]		A/B
185F5	𘗵						WH 1 43.272* TY A 53B31 TY B6 53B64	a kind of insect [ri̯ạ]	[185F6] [𘗶]	A
181BD	𘆽						WH 1 47.232 TY A 23B44 TY B2 24B25	horse [ngɪn]	185F6 𘗶	A
17F20	𗼠						WH 1 39.271 TY A 25A22 TY B2 25B63	merit [khwɪ]	181BD 𘆽	A
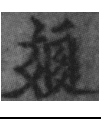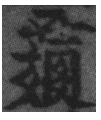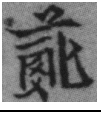
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17C7A	𗱺				𗱺		WH 1 79.262* TY A 06B57 TY B2 07B36 TYWH-C B46	steed [mai]	181BD 𘆽	A

Group 12: Chain of 4 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
172E9	𗋩				𗋩	𗋩	WH 3 14.211* TY A 11B56 TY B2 11A65 TYWH-A 03.053	rain [wẹ]	17F2E 𗼮	A
17F2E	𗼮				𗼮	𗼮	WH 3 14.211 TY A 30B31 TY B2 31A67	rain [ndzị̱ụ]	172E9 𗋩	A
17AB4	𗪴						WH 1 13.212* TY A 14A18 TY B2 14B66	rain [ndeɯ]	172E9 𗋩	A
17DDF	𗷟						TY A 45A67 TY B2 45B63	drought [·an]	172E9 𗋩	A

Group 13: Chain of 17 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18034	𘀴						WH 3 19.122* TY A 33B16 TY B2 34A13	to revolve [sị̱wan]		A
17CB3	𗲳				𗲳	𗲳	WH 3 19.122 TY A 40A41 TY B2 40B21	mill [ndźị̱ə]	18034 𘀴	A
186A2	𘚢				𘚢	𘚢	WH 3 19.232 TY A 40B74 TY B2 41A48	wheel [ndźị̱ə]	18034 𘀴	A
174A0	𗒠				𗒠		TY A 21B51 TY B2 22B35	cervical vertebra [kêi]	[186A2] [𘚢]	A/B
17653	𗙓					𗙓	WH 1 21.252 TY A 55A75	a transliteration [lwen]	186A2 𘚢	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1799D	須				須		WH 3 17.272 TY A 37A36 (TY B2 40A62)	close relative [ndźi̯ẹ]	186A2 㲋	A
17785	蘬					蘬	WH 1 32.242 TY A 40A63 TY B2 40B42	to turn [tśi̯wan]	1799D 須	A
17C8E	龑				龑		TY A 10A68 TY B2 11A71 TYWH-A 03.063	mill [vi̯ẹ]	[186A2] [㲋]	A
17F2C	獮						WH 1 30.271 TY A 07A76 TY B2 08A44	to twine [mban]	186A2 㲋	A
180E9	頹				頹		WH 1 55.171 TY A 36A71 TY B2 37A28	to twine [tśhi̯o]	186A2 㲋	A/B
18197	骹					骹	WH 1 40.212* TY A 34A37 TY B2 42A24 TYWH-A 22.013	to rotate [ndźâ]	186A2 㲋	A
17A73	緂						WH 3 8.162 TY A 39B18 TY B2 39B68	to pull [ndźwê]	18197 骹	A
174C7	骸				骸		TY A 24B15 TY B2 23A67 WHBY 72.49	cervical vertebra [kâ]	18197 骹	A
18364	顱						TY A 05A13 TY B5 05B76	curled hair [mbe]	[186A2] [㲋]	A/B
18418	頦				頦		WH 1 11.152 TY A 28A27 TY B2 28B34	to carve [ku]	186A2 㲋	A
186B9	韄					韄	WH 1 40.212 TY A 32A47 TY B2 32B64	whirlwind [swɪ]	186A2 㲋	A
186A3	韽					韽	WH 1 40.212* TY A 23B43 TY B2 24B22	whirlwind [ngɪn]	[186B9] [韄]	A

Group 14: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
180F5	羏		鞍	羏			TY A 51A67 TY B2 48A72 TYWH-A 17.194	direction [rı̣e]	17742 藜	A
17742	藜	藜	藜	藜	藜	藜	WH 1 13.162* TY A 51A65 TY B2 48A71 TYWH-A 17.193	central room [rı̣ə]	180F5 羏	A

Group 15: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FAF	緂	緂	緂	緂			WH 1 75.251* TY A 05A45 TY B5 06A37	arrow [mbọ]		A
18120	䍦		䍦	䍦			TY A 35A13 TY B2 35B43 WHBY 69.57	to shoot an arrow [tśhı̣a]	17FAF 緂	A
17F9F	緂	緂 緂	緂	緂		緂	WH 1 24.271* WH 1 29.232* TY A 10B13 TY B2 11B15	vast [wạ]	left: 17FAF 緂 right: 18736 緂	A (l) B (r)
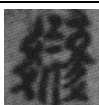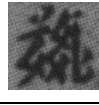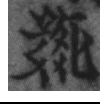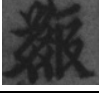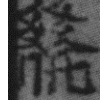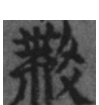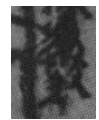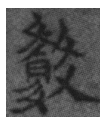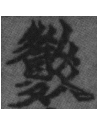
Group 16: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
186EF	斂	斂	斂	斂	斂		WH 1 11.172 TY A 25A31 TY B5 25B78	a surname [ngu]	186F2 斂	A
186F2	斂	斂	斂	斂			WH 1 11.162 TY A 25A32 TY B2 25B76	to patrol [ngu]	186EF 斂	A
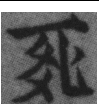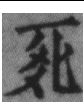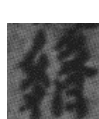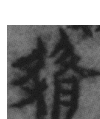
Group 17: 21 unchained characters (bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1730B	𗌋						TY A 44B77 TY B2 44B27	wild goose [xa]		A
17AB7	𗰷						WH 1 92.151* TY A 13B21 TY B2 14A65	a kind of bird [ndɪ]		A
17D80	𗶀						TY A 50B77 TY B2 51A76	parrot [ldi̯u]		A
17F8A	𗾊						TY A 03B42 TY B5 04B36	a kind of bird [vi̯e]		A
17F92	𗾒						TY A 14B77 TY B2 15B65	cuckoo [no]		A
17FA0	𗾠						TY A 51A22 TY B1 51B14	bat [ri̯u]		A
17FA2	𗾢						TY A 29B43 TY B2 30A75	bird [so]		A
17FA8	𗾨						WH 3 19.172* TY A 03A14 TY B1 04A13	crane [mẹ]		A
17FAD	𗾭						TY A 13B51 TY B2 14B27	cuckoo [nɪn]		A
17FC8	𗿈						TY A 21B76 TY B2 22B56	pigeon [khɪn]		A
17FD7	𗿗						TY A 04B13 TY B5 05A77	owl [mwei]		A
17FE9	𗿩						WH 1 66.212* TY A 35B36 TY B2 36A72	a kind of bird [tśi̯e]		A
17FF2	𗿲						WH 1 45.171* TY B2 38B36	a kind of bird [śwô]		A/B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FF9	繼			繼	繼	繼	WH 1 22.172* TY B2 43A74	crow [·ôn]		A
18043	羧		羧	羧	羧		TY A 42B14 TY B2 43A38	a kind of bird [·a]		A
18065	緿		緿	緿	緿		TY A 15B33 TY B2 16B15	a kind of bird [tɪn]		A/B
182F5	婗	婗	婗	婗			WH 1 52.221* TY A 05A42 TY B5 06A34	vulture [mbǫ]		A
182F8	婗		婗	婗			TY A 05A43 TY B5 06A35	sexual intercourse [mbǫ]	[182F5] [婗]	A
1853F	繇	繇	繇	繇	繇	繇	WH 1 59.242* TY A 53A78 TY B6 53B42	quail [lho]		A
18736	羧		羧	羧	羧		TY A 13A21 TY B2 13B77	wild goose [lįę]		A
187E6	羧	羧	羧	羧	羧	羧	WH 1 90.251* TY A 03A71 TY B1 04A71	mandarin duck [mbə]		A

Group 18: 4 unchained characters (not bird-related)

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17006	死	死	死	死	死	死	WH 1 86.152* TY A 25B67 TY B2 26B37	back of the body [ngįə]		A
1724A	燉		燉	燉			TY A 39A67 TY B2 39B51	burning hot [ndźįwei]		A
17FB4	緿		緿	緿	緿		TY A 04B24 TY B5 05B21	to divine [mu]		A
17FBD 17FBC	緇 緇	緇	緇	緇			WH 15.111* TY A 05A44 TY B5 06A36	to flee [mbǫ]		A

6.1.2 Ideographs with Component 267 Type B

Groups 19 through 38 have Type B Component 267 (𣥵), i.e. written with three strokes.

Group 19: Chain of 4 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F0D	𗃍						WH 1 30.141 TY A 33B72 TY B2 34A75	very close relative [·u]	17FC5 𗿅	B
17FC5	𗿅						WH 1 39.152 TY A 42A26 TY B2 42B43	marriage [·ɿ]	17F0D 𗃍	B
17DA8	𗶨						WH 1 83.261 TY A 18B51 TY B2 19A71	to reach [ndạ]	17F0D 𗃍	B
17323	𗌣						WH 1 9.141 TY A 23A31 TY B2 23B74	bridge [ngi̯u]	17DA8 𗶨	B

Group 20: Chain of 12 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1795B	𗥛						WH 1 89.231 TY A 53B22 TY B6 53B56	bone [ri̯ə]	179DC 𗧜	B
1707B	𗁻						TY A 49A54 TY B2 49B47	skeleton [lhi̯ə?]	[1795B] [𗥛]	B
177C2	𗟂						WH 1 49.211 TY A 24A74 TY B2 25A57	skeleton [ngâi]	1795B 𗥛	B
17AB1	𗪱						WH 1 33.222 TY A 03A68 TY B1 04A61	round bone [mbə]	1795B 𗥛	B
17E7C	𗹼						WH 1 26.151 TY A 27B31 TY B2 28A47	kidney [khwâ]	1795B 𗥛	B
185DB	𘗛						TY A 03B43 TY B5 04B37	skeleton [mbi̯u]	[1795B] [𗥛]	B
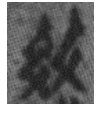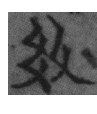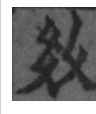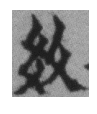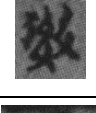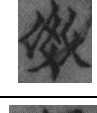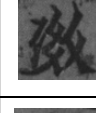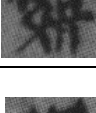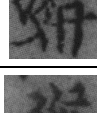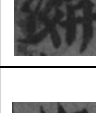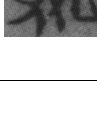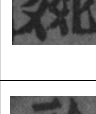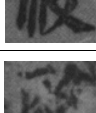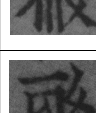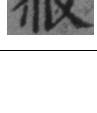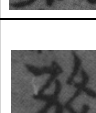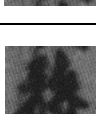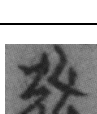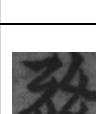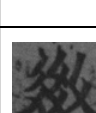
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
186B7	鞑						WH 1 36.271 TY A 48B44 (TY B2 49A17)	round bone [li̯ə]	1795B 繎	B
17F1D	繎						WH 1 57.272 TY A 53B51	round bone [li̯o]	1795B 繎	B
17ABB	繼						WH 1 83.241 TY A 08A72 TY B2 09A32	oath [ma̱]	1795B 繎	B
179DC	繎				繎	繎	WH 3 11.112 TY A 55B73	marrow [lhu]	1795B 繎	B
17FCA	縕				縕		WH 3 12.111* TY A 49B53 TY B2 50A45 WHBY 81.45	body [lwon]	1795B 繎	B
17F90	㸚				㸚		WH 3 12.111 TY A 55B21	a surname [lhi̯ei]	17FCA 縕	B

Group 21: Chain of 21 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F94	剡				剡	剡	WH 1 72.211* TY A 04B77 TY B5 05B72	the sun [mbe]		B
17245	繍				繍		WH 1 28.253 TY A 31A24 TY B2 31B54	hot [tsa]	17F94 剡	B
17D5D	爾				爾		WH 1 64.222* TY A 49A27 TY B2 49B13	hot [ldwon]	[17F94] [剡]	B
17D69	爨				爨	爨	TY A 49A28 TY B2 49B21	a lined Chinese-style coat or jacket [ldwon]	[17DCD] [爾]	B
17D3B	爨						TY A 05B65 TY B5 06B52	warm [mai]	[17DCD] [爾]	B
17FFE	纜				纜		WH 1 72.211 TY A 10A24 TY B2 11A22	east [vi̯ei]	17F94 剡	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F88	姣					姣	WH 1 24.211* TY A 04A27 TY B5 05A21 WHBY 67.16	able and virtuous people [me]	17F94 姣	B
170E4	姣						WH 1 54.161* TY A 04A31 TY B5 05A23	relief [me]	[17F88] [姣]	B
170F6	姣						WH 1 86.112* TY A 04A32 TY B5 05A24	illness [me]	[17F88] [姣]	B
179FE	姣						WH 1 14.242* TY A 12B15 TY B5 13A73 TYWH-A 06.141	emperor [thɪ]	17F88 姣	B
17E50	姣					姣	WH 1 63.211 TY A 17A34 TY B2 17B71	loyal [twụ]	17F88 姣	B
184F1	姣				姣		WH 1 35.111 TY A 26A77 TY B2 27A42	heaven, emperor [ngwə]	17F88 姣	B
17255	發						WH 3 10.172* TY A 35B43 TY B2 36A75 WHBY 91.66	saint [tśi̯ẹ]	17255 發	B
1761F	發						WH 3 10.172* TY A 48B72 TY B2 49A57 WHBY 61.15	holy [lu]	17255 發	B
179B4	姣						WH 1 82.121* TY A 04A28 TY B5 05A22	coal [me]	[17F88] [姣]	B
17FC0	姣				姣	姣	WH 1 82.121 TY A 31A36 TY B2 31B65	land [tsẹ]	179B4 姣	B
17762	姣				姣		WH 1 31.242 TY A 50B68 TY B2 51A66	a place name [lan]	179B4 姣	B
17C9F	姣						WH 1 33.112 TY A 02B25 TY B1 03B24	ore [pə]	179B4 姣	B
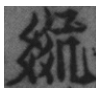
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FB9	絖						WH 1 15.153* TY A 33A75 TY B2 33B75 WHBY 61.52	for a particular person,occasion, purpose, etc. [tshwu]	179B4 絖	B
17FCF	緺						TY A 33A76 TY B2 33B76	fat [tshwu]	[17FB9] [絖]	B
17FDC	絖						WH 1 15.153 TY A 36B48 TY B2 37A78	shame [tɕhi̯e]	17FB9 絖	B

Group 22: Chain of 9 characters
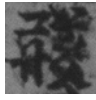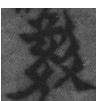
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F9E	緂					緂	WH 1 48.222* TY A 17A48 TY B2 18A16	daylight [ni̯ə]		B
174E5	緂				緂		WH 1 67.132* TY A 36B28 TY B2 37A63	dawn [śôn]	[17F9E] [緂]	B
17D68	緂				緂		WH 1 35.221 TY A 35B61 TY B2 36B18	dawn [śə̂]	17F9E 緂	B
17FF3	緂				緂	緂	WH 3 4.232 TY A 32A44 TY B2 32B61	time [ndzi̯e]	17F9E 緂	B
17F93	緂				緂	緂	WH 1 36.273 TY A 48B54 TY B2 49A22	noon [li̯ə]	17FF3 緂	B
17FAE	緂						WH 1 77.211 TY A 52B21 TY B2 52B63	what time [źi̯ə]	17FF3 緂	B
17FBA	緂						WH 1 71.252* TY A 02B42 TY B1 03B41 WHBY 75.44	time [mbɪn]	17FF3 緂	B
17FBE	緂						WH 1 65.262* TY A 46B31 TY B2 47A46 TYWH-A 23.104	to struggle [ri̯e]	17F9E 緂	B

| C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FBF	緂	緂	緂	緂	緂		WH 1 74.111* TY A 46B53 TY B2 47A47 TYWH-A 23.111	a kind of shell which looks like a jade [rie̯]	17FBE 緂	B
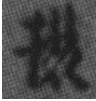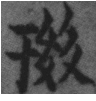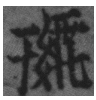
Group 23: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18126	骹	骹	骹	骹			WH 1 52.121 TY A 16A56 TY B2 17A34	bright [tie̯]	186DB 骹	B
186DB	骹	骹	骹	骹		骹	WH 1 52.122 TY A 16A57 TY B2 17A35	the sun [tie̯]	18126 骹	B

Group 24: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17A4A	緵		緵	緵	緵		TY A 32A62 TY B2 33A12	ancestor, source [tsu̯o]		B
181C6	緵	緵	緵	緵	緵		WH 1 32.271* TY A 32A61 TY B2 33A13	foal [tsu̯o]	[17A4A] [緵]	B

Group 25: Chain of 11 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1734A	毨	毨	毨	毨		毨	WH 1 42.251* TY A 30B37 TY B2 31A73	as [si̯u]		B
1734F	毨	毨	毨	毨		毨	WH 1 61.232* TY A 30B41 TY B2 31A74	a transliteration [si̯u]	[1734A] [毨]	B
17361	毨	毨	毨	毨	毨		WH 1 18.113* TY A 30B38 TY B2 31A75	brother-in-law [si̯u]	[1734A] [毨]	B
180F7	毨	毨	毨	毨			WH 1 8.252 TY A 16A55 TY B2 17A31	a surname [ni̯u]	1734A 毨	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18581	㦍						WH 1 25.122 TY A 33A58 TY B2 35B15	hollow bag [tsha]	1734A 㦍	B
17A86	㦎						WH 1 42.251 TY A 33B61 TY B2 34A65	to think [si̯wə]	1734A 㦍	B
184E0	㦏						WH 1 24.122 TY A 42A64 TY B2 43A25	sorrowful [·a]	17A86 㦎	B
1798C	㦐						WH 1 32.111 TY A 33B67 TY B2 34A72	mute [swan]	17A86 㦎	B
17FAB	㦑						WH 1 88.261* TY A 29A15 TY B2 35A48 WHBY 77.16	thought [si̯e]	17A86 㦎	B
1794F	㦒						TY A 43B44 TY B2 44A48 WHBY 86.18	dumbness [·o̩]	1734A 㦑	B
178A0	㦓						WH 1 52.211* TY A 02B75 TY B5 03B75 WHBY 71.74	boring [mə]	1734A 㦍	B

Group 26: Chain of 9 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17B98	㦔						WH 1 73.142* TY B2 38B45	food [si̯we]		B
178E3	㦕						WH 1 17.212 TY A 29A75 TY B2 30A41	food and drink [tshi]	17B98 㦔	B
185FE	㦖						WH 3 20.162 TY A 51B55 TY B2 52A44	to butcher [lhɪn]	178E3 㦕	B
187D7	㦗						WH 1 54.252* TY A 25A73 TY B2 26A46 TYWH-A 09.073	tooth [ku̩o]	178E3 㦕	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FE7	孍						WH 1 75.132 TY A 29A68 TY B2 30A34	medicated plaster [tsə̣]	178E3 夊	B
177C7	蘬						WH 1 75.141 TY A 29A67 TY B2 30A35	tea [tsə̣]	17FE7 孍	B
17789	蘬						WH 1 17.242 TY A 29B64 TY B2 30B31	a skilful woman [si]	177C7 蘬	B
17191	燃						WH 1 90.261* TY A 21B13 TY B2 22A62 TYWH-A 08.051 WHBY 71.16	to swallow [ngi̯a]	178E3 夊	B
17EF2	緂						WH 1 75.121 TY A 33B44 TY B2 34A54	excrement [tswə̣]	17191 燃	B

Group 27: Chain of 6 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17232	魝						WH 1 24.231 TY A 24B48 TY B2 25B26	far [khwa]	17239 魼	B
17239	魼						WH 1 20.142 TY A 31B43 TY B2 32A71	to inspect [si̯e]	17232 魝	B
17D24	犣						TY A 41B44 TY B2 42A65 TYWH-A 22.112	sentry [·i̯eɯ]	17239 魼	B
17416	毳						WH 1 15.151 TY A 35A78 TY B2 36A34	to arrive [tśi̯e]	17232 魝	B
17DC1	羰						WH 3 5.152 TY A 33B54 TY B2 34A15	far [ndzaɯ]	17232 魝	B
175A6	鱳						WH 1 62.213* TY A 40B13 TY B2 40B61	to dispatch [śi̯won]	[17232] [魝]	B

Group 28: Chain of 25 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18736	嶅				嶅	嶅	WH 1 86.112* TY A 50A11 TY B2 50A72	big [lie̯]		B
18183	羧				羧		WH 1 76.141 TY A 06B37 TY B5 07B16	ape [mbi̯ə]	18736 嶅	B/A
17F96	絊					絊	WH 1 92.241 TY A 27B34 TY B2 28A51	man [ngo̜]	18736 嶅	B
17FD5	緢				緢		TY A 44A34 TY B2 44B36	man [·wu̜]	[17F96] [絊]	B
17FF8	縼						WH 1 89.212* TY A 09B23 TY B2 10B23 TYWH-A 02.063	name [we]	17F96 絊	B
17FF7	縼				縼	縼	WH 3 17.231 TY A 36B66 TY B2 37B26	to have [ndźi̯ei]	18736 嶅	B
18783	嶅					嶅	WH 3 6.133 TY A 35A53 TY B2 36A11	a long narrow flag [ndźi̯on]	18736 嶅	B
17FFB	纜				纜	纜	WH 1 10.222 TY A 24B32 TY B2 25A77	phoenix [ku]	middle: 18736 嶅 left: 17FFC 纜	B (m) A (l)
17D4D	嶅						WH 1 71.221* TY A 47A65 TY B2 47B55 TYWH-A 24.093	mixed [li̯wu̜]	18736 嶅	B
1878F	嶅						WH 1 89.212* TY A 47A64 TY B2 47B57 TYWH-A 24.102	surname of a tribe [li̯wu̜]	嶅	B
17FA7	嶅				嶅		WH 3 9.242* TY A 18A54 TY B2 18B71 WYBY 70.46	a surname [ni̯auu]	18736 嶅	B

Investigation of Tangut unification issues

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
181C7	𘇇						WH 1 7.122* TY A 03B47 TY B5 04B43 WHBY 62.48	elephant [mbi̯u]	18736 𘃔	B
17F9F	𗾟						WH 1 29.232* TY A 10B13 TY B2 11B15 TYWH-A 03.101	vast [wạ]	right: 18736 𘃔 left: 17FAF 𗾯	B (r) A (l)
183E8	𘏨						WH 1 75.172 TY A 55A36	treasure [ldi̯ə]	17F9F 𗾟	B
1801A	𘀚						WH 1 57.172 TY A 35A56 TY B2 36A21	origin [tśhô]	183E8 𘏨	B
17F8A	𗾊						WH 1 6.233* TY A 10A77 TY B2 11A78 TYWH-A 03.083	warehouse [vi̯e]	183E8 𘏨	B
17F98	𗾘						WH 1 34.251* TY A 10B11 TY B2 11B11 TYWH-A 03.091	the back of somebody or something [vi̯e]	17F8A 𗾊	B
17C17	𗰗						WH 1 81.112* TY A 42B68 TY B2 43B23 WHBY 84.41	ten [·ạ]	17F8A 𗾊	B
17F29	𗼩						TY A 42B71 TY B2 43B22	a happily married couple [·ạ]	[17C17] [𗰗]	B
17C27	𗰧						WH 3 7.222* TY A 48B35 TY B2 49A43	a unit of length [lhọ]	17C17 𗰗	B
17FD2	𗿒						WH 1 7.122* TY A 27B21 TY B2 28A41 TYWH-A 12.111	big [khwei]	18736 𘃔	B
17FEE	𗿮						WH 1 32.272 TY A 02B23 TY B1 03B22	people of father's generation [pə]	17FD2 𗿒	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17B34	繎				𢆡		WH 1 50.262 TY A 55B55	equal [lai]	17FD2 繎	B
17CE5	癹						WH 3 18.242 TY A 38B68 TY B2 39A61	to exercise forbearance [ndʑi̯u]	17FD2 繎	B
17FF1	繎						WH 1 28.211* TY A 03B61 TY B5 04B58 WHBY 75.28	mother [mɪn]	17FD2 繎	B

Group 29: Chain of 5 characters
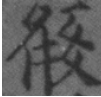
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
184A8	醚						WH 1 70.152* TY A 04A47 TY B5 05A38	to express by words [phɪn]		B
175EA	揪						WH 1 20.113 TY A 25B43 TY B2 26B14	commerce [ki̯e]	184A8 醚	B
1767E	謎				謎		WH 1 13.121* TY A 28B38 TY B2 29A44 WHBY 77.24	golden [kwai]	175EA 揪	B
18015	誕				誕		WH 1 81.272 TY A 31A35 TY B2 31B63	spot [tsẹ]	1767E 謎	B
17CB2	讟						WH 1 64.121 TY A 47A55 TY B2 47B46	brightness [lwụ]	18015 誕	B

Group 30: Chain of 3 characters
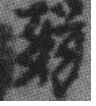
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1822D	癹						WH 1 70.271* TY A 44B23 TY B2 45A13 WHBY 60.72	god [·u]	182FE 餤	B
1822B	癹				癹	癹	TY A 44B24 TY B2 45A17	a surname [·u]	[1822D] [癹]	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
182FE	𬀾						WH 1 62.261 TY A 35A36 TY B2 35B62	god [śi̯uo]	1822D 𬀿	B
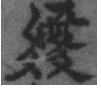
Group 31: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1836D	𘍭						WH 1 91.251* TY A 30A76 TY B2 31A43 WHBY 66.76	cleverness [swi]	1822C 𘈬	B
1822C	𘈬						WH 1 91.251* TY A 12B28 TY B5 13B16 TYWH-A 06.164	a skilled workman [ndi̯e]	1836D 𘍭	B

Group 32: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FF0	𗿰						WH 1 53.172* TY A 22B67 TY B2 23B52	steps [ka̱i]		B
1772A	𗜪						WH 1 53.172 TY A 53B21 TY B6 53B55	building [leɯ]	17FF0 𗿰	B
17359	𗍙						TY A 09B27 TY B2 10B31 TYWH-A 02.081	curtain [we]	17FF0 𗿰	B

Group 33: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FDE	𗿞						WH 1 73.221 TY A 15A74 TY B2 16A57	to mate [ndi̯ei]	17FEF 𗿯	B
17FEF	𗿯						WH 1 73.212 TY A 15A75 TY B2 16A56	to trample [ndi̯ei]	17FDE 𗿞	B

Group 34: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17C4C	𗱌						WH 1 86.241* TY A 13A63 TY B2 14A48 WHBY 60.36	to free oneself [thu]	17C41 𗱁	B
17C41	𗱁						WH 1 38.122 TY A 12B18 TY B2 13A78	to call [thɪ]	17C4C 𗱌	B

Group 35: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FE2	𗿢						WH 1 11.212* TY A 53A51 TY B6 53B13	imperial edict [źu̥]		B
1766B	𗙫						WH 3 9.151 TY A 45A43 TY B2 45B42	a transliteration [om]	17FE2 𗿢	B

Group 36: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17353	𗍓						WH 1 84.161* TY A 52B78 TY B1 53A46	to repent [rȩɯ]		A
185B3	𘖳						WH 1 17.172 TY A 22B77 TY B2 23B61	to realize [ngi]	17353 𗍓	B/A
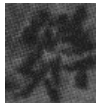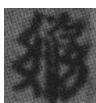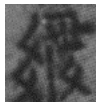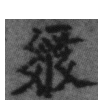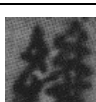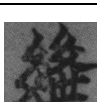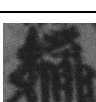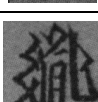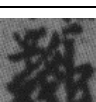
Group 37: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FE0	𗿠						WH 1 36.262* TY B2 38B56	amber [tśi̥weɯ]		B
17FD0	𗿐						WH 1 54.163* TY B2 38B55	light yellow [tśi̥weɯ]	[17FF0] [𗿰]	B
17F9C	𗾜						TY B2 38B57	cheese [tśi̥weɯ]	[17FF0] [𗿰]	B

Group 38: 19 unchained characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
174B7	虠						WH 1 26.212* TY A 53B26 TY B6 53B62	parents [rįa]		B
1753B	蘱						WH 1 17.242* TY A 43A35 TY B2 43B56	dexterous [·įa]		B
1762D	羡						WH 1 24.211* TY A 13A23 TY B2 13B76	a surname [tha]		B
17679	羡						TY A 53A77 TY B6 53B43	the moon [lhon]		B
17841	毿						WH 1 29.142* TY A 23B58 TY B2 24B41	a round flat cake [ngįa]		B
179FD	絲						WH 1 89.272* TY A 33A48 TY B2 35B14	to astonish [tsụo]		B
17D08	毿						WH 3 9.272* TY A 14A58 TY B2 15A45	bear [ndon]		B
17F89	綵						WH 1 52.173* TY A 31B72 TY B5 32B26	close [seɯ]		B
17F8D	絹						WH 1 90.252* TY A 23A77 TY B2 24A62	to rise [ngwi]		B
17F91	殺						TY A 05B76 TY B5 06B63	nephew [mo]		B
17F9A	綵						WH 1 26.212* TY A 13B52 TY B2 14B17	people of father's generation [nɪn]		B
17FA5	綵						WH 1 26.112* TY A 31B61 TY B2 32B15	the day after tomorrow [sa]		B
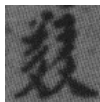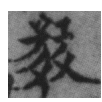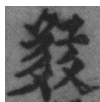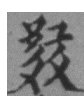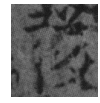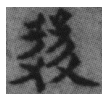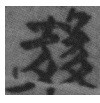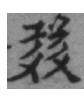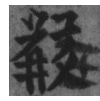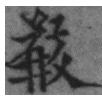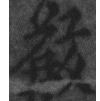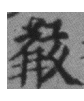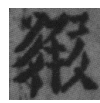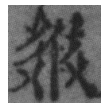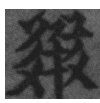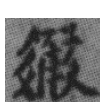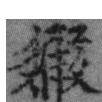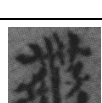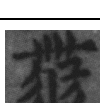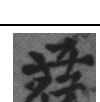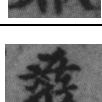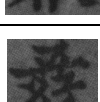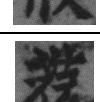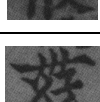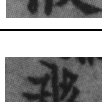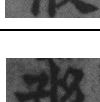
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FAA	絴						WH 1 50.111* TY A 18A53 TY B2 18B72	wisdom [ni̯a]		B
17FC2	綖						WH 1 82.221* TY A 23B14 TY B2 29A57	impressive and dignified [kɪn]		B
17FC6	綃						WH 1 78.172* TY A 35A21 TY B2 35B51	to clear away [śi̯ei]		B
17FDF	綬						WH 1 43.132* TY A 07B61 TY B2 08B18	deep pool [mi̯u]		B
17FE3	緣						WH 1 32.161* TY A 02B16 TY B1 03B15	god [mi̯e]		B
17FEA	緫						WH 1 40.241* TY A 31B62 TY B2 32B16	to detest [sa]		B
180D6	緐						WH 1 33.211* TY A 52A17 TY B2 52A71	fountainhead [źa̱]		B

6.2 Evidence for Component 316

6.2.1 Ideographs with Component 316 Type A
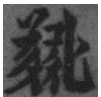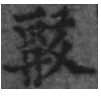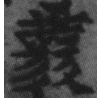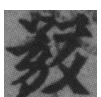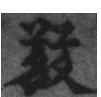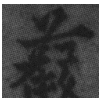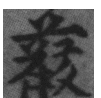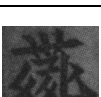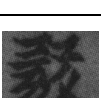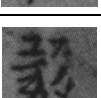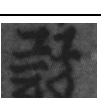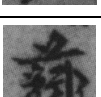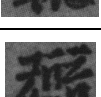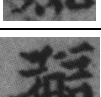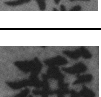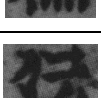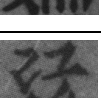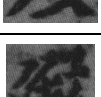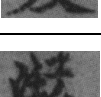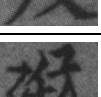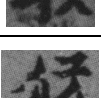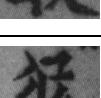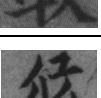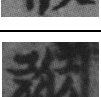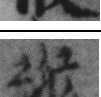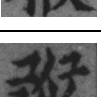
Groups 1 through 20 have Type A Component 316 (㣺), i.e. written with five strokes.

Group 1: Chain of 36 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
183DA	㣺					㣺	WH 1 73.162* TY A 14B34 TY B2 15B33	the place where something happen [tįei]		A
18147	㣺					㣺	WH 1 16.262 TY A 15B45 TY B2 16B26	a prefix representing no [ti]	183DA 㣺	A
1816A	㣺						TY A 19B23 TY B2 20A35	a transliteration [ta]	[18147] [㣺]	A
185E0	㣺				㣺	㣺	WH 1 23.242 TY A 42A57 TY B2 42B78	door [·a]	183DA 㣺	A
180C4	㣺						WH 3 4.162 TY A 34A15 TY B2 32A26	grip [ndzįwẹ]	183DA 㣺	A
17359	㣺						TY A 09B27 TY B2 10B31 TYWH-A 02.081	curtain [we]	183DA 㣺	A
17AB3	㣺						WH 3 15.212* TY A 09B21 TY B2 10B21 TYWH-A 02.061	to teach [we]	17359 㣺	A
17DC5	㣺				㣺		TY A 37A17 TY B2 39A17	curtain [śįə]	[17359] [㣺]	A
17C89	㣺						WH 3 18.121 TY A 41A67 TY B2 41B37	to have [ndźįo]	183DA 㣺	A
17701	㣺				㣺	㣺	WH 3 19.142 TY A 40A56 TY B2 40B36	Chinese ink [ndźįon]	17C89 㣺	A
1813E	㣺				㣺		WH 1 70.112* TY A 17A55 TY B2 18A23 WHBY 91.47	to move [nįuo]	183DA 㣺	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1840F	夷				夷		WH 1 73.122 TY A 14B35 TY B2 15B23	to set up [tiẹi]	183DA 夷	A
18500	叕						WH 1 7.162 TY A 10A38 TY B2 11A44	pot [vi̯u]	1840F 夷	A
18499	叠				叠		WH 1 13.242 TY A 17A22 TY B2 17B62	to pile up [twe]	1840F 夷	A
17BF3	叕						WH 1 39.241 TY A 15A64 TY B2 16A51	luxuriant [nwɪ]	1840F 夷	A
17506	叕						WH 1 58.162 TY A 30A34 TY B2 30B67	to store [si̯o]	1840F 夷	A
1772C	叕						WH 1 59.172 TY A 55B56	to gamble [li̯o]	1840F 夷	A
18118	叕						WH 1 61.212 TY A 45B12 TY B2 45B76	to surrender [·ôn]	1840F 夷	A
17522	叕						WH 1 73.121 TY A 14B36 TY B2 15B22	to make (wine, vinegar) [tiẹi]	1840F 夷	A
1816F	叕				叕		WH 3 3.161 TY A 30B24 TY B2 31A56	to lose [ndzɪ]	1840F 夷	A
17291	叕						WH 3 5.222 TY A 34A51 TY B2 34B47	water spring [ndzi̯wan]	1840F 夷	A
184D7	叕						WH 3 5.232 TY A 34A55 TY B2 34B52	concentrated [ndzə]	1840F 夷	A
17890	叕					叕	WH 1 6.221 TY A 44B28 TY B2 46B52	grave [·u]	1840F 夷	A
175B1	叕						WH 3 9.212 TY A 45B77 TY B2 46A67	a transliteration [·wu?]	17890 叕	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18354	𗁔						WH 1 72.232 TY A 38B47 TY B2 39A45	bitter [tɕi̯ei]	1840F	A
17AA4							WH 1 72.231 TY A 38B48 TY B2 39A44	humble [tɕi̯ei]	18354	A
17211							WH 3 3.242 TY A 30B47 TY B2 31B13	hard punishment [ndzi]	18354	A
17769							WH 3 4.211 TY A 31A78 TY B2 32A38	to be imprisoned [ndzon]	18354	A
181D2							WH 1 82.251 TY A 11A38 TY B2 12B61	to cherish [wẹ]	1840F	A
17CB9							WH 1 12.131 TY A 52B44 TY B1 53A16	stingy [li̯u]	181D2	A
171C0							WH 3 3.161* TY A 04A55 TY B5 05A44	to throw [phə]	[181D2] [ ]	A
17A7C							WH 1 30.142 TY A 49B65 TY B2 50A56	to cherish [ldaɯ]	181D2	A
182BF							WH 1 30.142* TY A 05B36 TY B5 06B22	to cherish [mba]	[17A7C] [ ]	A
1752E							WH 1 81.222* TY A 20B66 TY B2 21B53 TYWH-A 07.071	to cherish [ngôn]	182BF	A
184E1							WH 1 81.222 TY A 51A31 TY B1 51B25	to cherish [ri̯u]	181D2	A
18112							TY A 08B13 TY B2 09A43	a transliteration [pa]	[181D2] [ ]	A

Group 2: Chain of 7 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
171F5	袞					袞	WH 3 22.161 TY A 55B22	old [lhwi]	17AFF 㲋	A
17224	䰜						WH 1 7.241 TY A 36A48 TY B2 41B42	tattered [śi̯u]	171F5 袞	A
17AFF	㲋						WH 1 18.162 TY A 24B58 TY B2 25B36	used [kwi]	171F5 袞	A
171A7	熊					熊	WH 1 55.113 TY A 34A13 TY B2 34B16	new [si̯ew]	17AFF 㲋	A
170C8	熊				熊		TY A 32A53 TY B2 32B68	new [swɪ]	[171A7] [熊]	A
17AAE	絲						TY A 04A35 TY B5 05A27	new [me]	[171A7] [熊]	A
18155	鼀						WH 1 61.112 TY A 56A21	to be undivided [źon]	17AFF 㲋	A

Group 3: Chain of 14 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17A2C	㲋				㲋		WH 1 80.231 TY A 47A12 TY B6 56A38	narrow [ru̯]	1834B 㲋	A
1732C	瀰						WH 3 20.242* TY A 19B15 TY B2 20A27 WHBY 89.49	moisture [ndi̯a̱]	17A2C 㲋	A
182F7	瀰						WH 3 16.162* TY A 34A48 TY B2 34B46	to force	[1732C] [瀰]	A
1834B	㲋						WH 1 80.231* TY A 46A67 TY B2 46B76 TYWH-A 23.022	narrow [ra̱]	17A2C 㲋	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17F82	𗾂						WH 1 10.221 TY A 24B28 TY B2 25A76	valley [ku]	17A2C 𗨬	A
175FF 1816D	𗗿 𘅭						WH 1 22.161 TY A 16B27 TY B2 17A68	dog [ta]	17A2C 𗨬	A
1831A	𘌚						WH 1 34.231 TY A 49B77 TY B2 50A71	wide or narrow [ldə]	17A2C 𗨬	A
1828C	𘊌						WH 1 53.251 TY A 40B12 TY B2 37B63	indignation [ndʑêɯ]	17A2C 𗨬	A
1878A	𘞊						WH 1 53.261* TY A 22A73 TY B2 23A52	indignant [khậ]	[1828C] [𘊌]	A
17EFB	𗻻						WH 1 25.253 TY A 39B66 TY B2 40A42	a kind of waterweeds [tśâ]	1878A 𘞊	A
177CC	𗟌						TY A 12A35 TY B2 13A26 TYWH-A 06.042	to hold [tho]	17A2C 𗨬	A
177C1	𗟁						TY A 12A37 TY B2 13A27 TYWH-A 06.043	wine [tho]	177CC 𗟌	A
184B5	𘒵						WH 1 41.162* TY A 12B68 TY B2 20B13	to press [toṇ]	[182F7] [𘋷]	A
1878B	𘞋						TY A 33B52 TY B2 34A26	full [tsɹ]	[1831A] [𘌚]	A/B

Group 4: Chain of 9 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17912	𗤒						WH 1 54.132 TY A 22B41 TY B2 23B24	age [kɨeɯ]	170A3 𗂣	A/B
170A3	𗂣						WH 1 14.271 TY A 09B75 TY B2 10B72	age [vɨe]	17912 𗤒	A/B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
174B1	𗒱	img		img	img	img	WH 1 15.253 TY B2 38B24	year [śi̯we]	17912 𗘰	A/B
1710B	𗄋	img	img		img	img	WH 1 15.271 TY A 55A77	a transliteration [źi̯e]	17912 𗘰	A/B
17AAD	𗪭	img	img	img	img	img	WH 1 40.271 TY A 13B68 TY B2 14B52	ago [nə]	17912 𗘰	A/B
1729B	𗊛	img	img	img	img	img	WH 1 53.132 TY A 32B31 TY B2 35A77	a transliteration [tsheɯ]	17912 𗘰	A/B
17724	𗜤	img	img	img	img		WH 1 54.143 TY A 22B45 TY B2 23B27	a kind of tree [ki̯eɯ]	17912 𗘰	A
1823C	𘈼	img	img	img			WH 1 15.171* TY A 06B25 TY B5 07A75 TYWH-C A55	in the past [ma]	17912 𗘰	A/B
170A5	𗂥	img	img	img			WH 1 15.171* TY A 13B46 TY B2 14B23	before [nɪn]	[1823C] [𘈼]	A

Group 5: Chain of 4 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1767F	𗙿	img	img	img			WH 1 64.141* TY A 42A37 TY B2 42B53	to guard [·i̯u]		A
17D85	𗶅	img	img	img			WH 1 64.141 TY A 40B47 TY B2 41A23	to guard [tśi̯u]	1767F 𗙿	A
174D1	𗓑	img	img	img	img	img	WH 1 62.151* TY A 43A44 TY B2 44A11	to guard [·wai]	[17D85] [𗶅]	A/B
1735F	𗍟			img			TY B2 14A62	to defend [ndɪ]	[1767F] [𗙿]	A

Group 6: Chain of 13 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
175D8	祋						WH 1 72.173* TY A 51B47 TY B2 52A13	sweet [ldɿ]		A
1783C	啜						TY A 53A16 TY B1 53A52	tasty [ldi̯e]	[175D8] [祋]	A
172D4	緅						WH 1 18.153 TY A 19A56 TY B2 19B68	sweet [thwi]	175D8 祋	A/B
1830B	㪣						WH 3 22.122 WH 1 5.142*	wheat [li̯ei]	175D8 祋	A
17CC9	祅						WH 1 63.143* TY A 12B37 TY B2 13B22 TYWH-A 06.174	fields [thɿn]	175D8 祋	A
17DA5	鑒						WH 1 53.262 TY A 28A57 TY B2 28B64	to collapse [kêɯ]	17CC9 祅	A
18131	㺔						WH 1 52.132 TY A 19A22 TY B2 16B44	a transliteration [thi̯e]	17CC9 祅	A
17CCB	祇						WH 1 47.241 TY A 23B45 TY B2 24B26	to open [ngɪn]	17CC9 祅	A
171D5	褒						WH 1 24.152 TY A 46B63 TY B2 47A72	open wide [la]	17CCB 祇	A
1781D	屐						WH 3 9.153 TY A 45B14 TY B2 45B78	a transliteration [·a]	17CCB 祇	A
18224 17023	㠶 屐						WH 1 84.112 TY A 45A75 TY B2 45B71	to open (one's mouth) [xa̠]	17CCB 祇	A
17E40	謔						WH 1 51.123 TY A 41A21 TY B2 41A65	to open (one's mouth) [tɕâi]	17023 屐	A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
185AF	羲						WH 1 6.171* TY A 51A68 TY B2 48A73 TYWH-A 17.201	a kind of container to cook [rįə]	175D8 夜	A

Group 7: Chain of 7 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17167	疑						WH 1 91.232* TY A 23A35 TY B2 24A18 WHBY 62.611	tendon [ngįu]	18070 涎	A
17EDE	緁						WH 1 36.272* TY A 23A33 TY B2 24A17	a kind of grass [ngįu]	[17167] [疑]	A
18153	蹶						WH 1 91.232 TY A 50A31 TY B2 50B25	pulse [źųo]	17167 疑	A
17356	琓						WH 1 91.252 TY A 27A16 TY B2 27B38	muscle [kįe]	17167 疑	A
177F0	礮						WH 3 10.242 TY B6 54A44	to like the new and loathe the old [lhwi]	17167 疑	A
18070	涎						WH 1 65.221* TY A 50B18 TY B2 50B77	muscle and joints [lęi]	[17167] [疑]	A/B
17E4C	謎						WH 3 10.242* TY A 30A65 TY B2 31A27	new [sɿ]	[177F0] [礮]	A

Group 8: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18052	襚						WH 1 52.123* TY A 50B22 TY B2 51A16	to brush [rįụo]		A

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18139	㓕						WH 1 20.261 TY A 19A21 TY B2 19B37	to brush [twen]	right: 18052 䕫 left: 181AB 䄞	A (r) A (l)

Group 9: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
181AB	䄞						WH 1 52.123 TY A 16A58 TY B2 17A36	to comfort [tie̜]	18139 㓕	A
18139	㓕						WH 1 20.261 TY A 19A21 TY B2 19B37	to brush [twen]	left: 181AB 䄞 right: 18052 䕫	A (l) A (r)
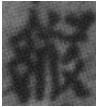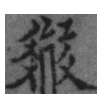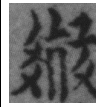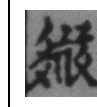
Group 10: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17656	禎						WH 1 30.262 TY A 07A54 TY B2 08A23	a transliteration [phan]	179BA 猿	A
179BA	猿						WH 1 30.261 TY A 07A53 TY B2 08A22	a surname [phan]	17656 禎	A
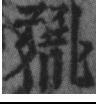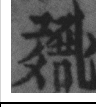
Group 11: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17177	㵣						WH 3 6.241 TY A 36B64 TY B2 37B23	tooth [ndźi]	18497 蘁	A
18497	蘁						WH 1 32.122 TY A 07A63 TY B2 08A31	front tooth [pân]	17177 㵣	A
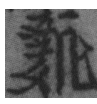
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FD6	𗿖						WH 1 31.111* TY A 28A68 TY B2 28B75 TYWH-A 15.082	goose [ngâɯ]	17177 㦜	A

Group 12: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1816C	𘅬						WH 1 38.111 TY A 12B25 TY B2 13B12	to enclose [thɿ]	1804E 𘁎	A
1804E	𘁎						WH 1 37.273 TY A 12B24 TY B2 13B11	a place name [thɿ]	1816C 𘅬	A

Group 13: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17C78	𗱸				𗱸	𗱸	WH 1 63.252 TY A 49A57 TY B2 49B52	stone [ldụ]	18789 𘞉	A
1723A	𗈺						WH I62.131* TY A 14B33 TY B2 15B21	ore [nâɯ]	[17C78] [𗱸]	A
18789	𘞉						WH 1 43.152 TY A 50A73 TY B2 50B61	ore [lei]	17C78 𗱸	A

Group 14: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17FE9	𗿩						WH 1 66.212* TY A 35B36 TY B2 36A72	a kind of bird [tɕiẹ]		A
17A5F	𗩟				𗩟	𗩟	WH 1 66.212 TY A 35B35 TY B2 36A65	age [tɕiẹ]	17FE9 𗿩	A

Group 15: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1855A	㲳		㲳	㲳			TY A 15B77 TY B2 16B58	to post [nai]	[18553] [㲳]	A/B
18553	㲳		㲳	㲳		㲳	TY A 17A26 TY B2 17B66	to send [noɯ]	[1855A] [㲳]	A

Group 16: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17768	蔟	蔟	蔟	蔟	蔟		WH 1 77.232 TY A 15A56 TY B2 16A45	a kind of bamboo [tọ]	18338 蔟	A/B
18338	蔟	蔟	蔟	蔟			WH 1 77.231 TY A 15A57 TY B2 16A44	west [tọ]	17768 蔟	A/B

Group 17: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1733B	痕	痕	痕	痕	痕		WH 1 5.173* TY A 45B26 TY B2 46A21	to subdue [ʔa]		A
17DD9	服		服	服	服		TY A 52B76 TY B2 50B78 WHBY 85.59	colt	[1773B] 痕	A
1731A	纞	纞	纞	纞		纞	WH 1 13.312* TY A 18A16 TY B2 20B56	an overcast sky [nɿ]	[1773B] 痕	A

Group 18: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
174DB	巓		巓	巓			TY A 13A43 TY B2 21A26	wizard [nwə]		A/B
17758	巓	巓	巓	巓	巓		WH 3 21.122* TY A 13A44 TY B2 21A27	bamboo [nwə]	[174DB] [巓]	A

Group 19: 2 characters with mixed derivations for Component 316

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17A1F	薂						WH 1 90.252* TY A 06A62 TY B5 07A46	to move [mi̯u]		
18146	㱰						WH 1 48.272 TY A 33A18 TY B2 35B13	to grind [swɪn]	top left: 180F6 毲 bottom left: 17A1F 薂	A
1848C	蘒						WH 3 9.272 TY A 05A46 TY B2 06A38	leopard [mbo̯]		
17C33	猭				猭		WH 3 9.272 TY A 48A42 TY B2 48B34	bear [lhɪ]	top right: 17C2f 猭 bottom right: 1848C 蘒	A

Group 20: 3 unchained characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1770A	薻						WH 1 90.121* TY A 36A18 TY B2 36B54	fear [tɕi̯a]		A
17DEB	䫼					䫼	WH 1 82.271* TY A 17A52 TY B2 18A18	annoyance [ni̯ə]		A
183EA	猭				猭		TY A 18A15 TY B2 20B55	a surname [nai̯]		A

6.2.2 Ideographs with Component 316 Type B

Groups 21 through 37 have Type B Component 316 (彐), i.e. written with four strokes.

Group 21: Chain of 33 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1813C	𗄼						WH 1 38.232* TY A 21B78 TY B2 22B53	leg [khɪn]		B
18137	𗄷					𗄷	WH 1 28.161 TY A 03A44 TY B1 04A41	stirrup [ma]	1813C 𗄼	B
1807F	𗁿					𗁿	WH 1 28.161* TY A 25B66 TY B2 26B36	stirrup [ki̯wei?]	[1813C] [𗄷]	A/B
1766E	𗙮				𗙮		WH 1 37.141 TY A 40B43 TY B2 41A17	foot mark [tshi̯wə]	1813C 𗄼	B
18169	𘅩						WH 1 66.222 TY A 35B42 TY B2 36A67	rope [tśi̯e]	1813C 𗄼	B
18157	𗅗					𗅗	WH 1 74.111 TY A 52A72 TY B6 56B16	boots [źi̯ei]	1813C 𗄼	B
18130	𗄰						WH 1 27.171 TY A 41A24 TY B2 41A68	overshoes [tśi̯wa]	18157 𗅗	B
18098	𗃘						WH 1 62.121 TY A 36B21 TY B2 37A61	to jump [śi̯on]	18157 𗅗	B
17BC6	𗯆						WH 1 62.121* TY A 03B17 TY B2 08B75	to jump [mi̯ə]	[18157] [𗅗]	B
1722C	𗈬						WH 3 9.131 TY A 44A27 TY B2 44B32	boots wearing in mud [a?]	18157 𗅗	A/B
1750C	𗔌						WH 1 23.123* TY A 52A71 TY B6 56B17	shoes [źi̯ei]	[18157] [𗅗]	B
17100	𗄀						TY A 52A71*	boots	[1750C] [𗔌]	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17B53	𧗨						WH 1 45.111 TY A 43A26 TY B2 43B43	shoes [·êi]	17B53 亥	A/B
1814F							WH 1 80.171 TY A 32B76 TY B2 33B18	stain [tsụ]	1813C 𦣻	B
18165							WH 1 80.172 TY A 32B77 TY B2 33B21	to suffer from an illness [tsụ]	1814F	B
1816E							WH 1 91.212 TY A 33A52 TY B2 33B57	pounding [tsụo]	1813C 𦣻	B
17DF9							WH 3 5.141 TY A 33B35 TY B2 34A45	to kick [ndzụ]	1813C 𦣻	B
17F74							WH 1 31.142 TY A 14A76 TY B2 15A63	to kick [ndan]	17DF9	B
1812B							TY A 31B13 TY B2 32A44	to kick [tsị̱wụ]	[17DF9] [ ]	B
17DAE							WH 1 30.212 TY A 27B68 TY B2 28B11	to jump [ngị̱a]	1813C 𦣻	B
18139							WH 1 49.243* TY A 52A63 TY B2 52B44 WHBY 76.43	to jump [lɪn]	left: 17DAE right: 18156	B (l) B (r)
17DB2							WH 1 22.211 TY A 16B31 TY B2 17A75 WHBY 18.11	to flee [ta]	17DAE 1813C 𦣻	B
17DCC							WH 1 13.112 TY A 19A76 TY B2 20A18	to run [te]	17DB2	B
17DC8							WH 1 35.131 TY A 19B27 TY B2 20A41	a transliteration [tə]	17DCC	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1814B	頦						WH 1 29.143* TY A 26A41 TY B2 26B72 TYWH-A 10.092	knee [ngwẹ]	1813C 頦	B
18162	頦						WH 1 6.211 TY A 32B17 TY B2 33A33	to sit cross-legged [tshu]	1814B 頦	B
17009	頦						TY A 21B48 TY B2 22B34 WHBY 74.65	ankle [kêi]	1814B 頦	B
170A4	頦						WH 1 7.112* TY A 06B32 TY B2 07B11 TYWH-C B13	to crawl [mbâ]	1814B 頦	B
17157	頦						WH 1 43.222 TY A 05B61 TY B2 06B46	to kneel [mei]	1814B 頦	B
1814C	頦						WH 1 7.112 TY A 05A33 TY B5 06A24	to crawl [mbi̯u]	1814B 頦	B
18178	頦						WH 3 10.271 TY A 52A32	trousers [li̯e]	1814C 頦	B
1753A	頦						TY A 52A31 TY B6 56A68	Pants, trousers [li̯e]	[18178] [頦]	B
18145	頦						WH 1 65.172 TY A 16A46 TY B2 17A26	leg [ndi̯u]	1814C 頦	B
18147	頦						WH 1 44.112 TY A 26A27 TY B2 26B64	respectful [kei]	1814C 頦	B
18168	頦						TY A 27B58 TY B2 28A71 TYWH-A 41	dysentery [nga]	1813C 頦	B

Group 22: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1813A	頦						WH 1 70.231 TY A 08B53 TY B2 09B12	thigh [mbi̯a]	1813B 頦	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1813B	𗀻				𗀻		WH 1 29.143 TY A 53B78 TY B6 54A37	lower limbs [lwa]	1813A 𗀺	B
18174 18175	𗀸 𗀸						WH 1 29.151 TY A 54A11 TY B6 54A38	to make a detailed inquiry [lwa]	1813B 𗀻	B

Group 23: Chain of 5 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18163	𗅣				𗅣	𗅣	WH 3 15.121* TY A 15A43 TY B2 16A33	matter [ndạ]		B
1816B	𗅫					𗅫	WH 1 7.211 TY A 36A61 TY B2 37A17	to do [tśi̯u]	18163 𗅣	B
18144	𗅩						WH 1 29.111 TY A 33A25 TY B2 33B34	to do [sa]	1816B 𗅫	B
1817B	𗅻						WH 1 32.151 TY A 45A72 TY B2 45B66	leisure [·ân]	1816B 𗅫	B
18135	𗅢						WH 1 32.151* TY A 44B33 TY B2 45A25	leisure [·o]	[1816B] [𗅻]	B

Group 24: Chain of 9 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1812F	𗄯					𗄯	WH 3 11.211	oblique [lhi̯we]	172B9 𗄰	B
172B9	𗄰						WH 1 55.221 TY A 54B52	crooked [li̯wo]	1812F 𗄯	B
176B3	𗅅						WH 1 10.223 TY A 24B31 TY B2 25A78	neck of a plough [ku]	1812F 𗄯	B
17715	𗅆						WH 1 44.232 TY A 21B52 TY B2 22B31	neck of a plough [kêi]	1812F 𗄯	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18301	襚						WH 1 91.222 TY A 45B68 TY B2 46A61	crooked [·ụo]	1812F 虼	B
17E54	祂						WH 3 12.122 TY A 55B41	oblique, to tilt [lhwẹ]	1812F 虼	B
17F55	燬						WH 1 60.132* TY A 26A34 TY B2 26B67 TYWH-A 10.081	valley [kôn]	1812F 虼	B
17F7B	燬						WH 3 14.121* TY A 26A35 TY B2 26B68 TYWH-A 10.082	tool [kôn]	17F55 燬	B
17537	爒						TY A 41A54 TY B2 40A57 TYWH-D 02.043	a transliteration [tśôn]	17F55 燬	B

Group 25: Chain of 6 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17A1F	燚						WH 3 8.172 TY A 40A37 TY B2 40B17	oblique [ndźa?]	17A73 燚	B
17A73	燚						WH 3 8.162 TY A 39B18 TY B2 39B68	to pull [ndźwê]	17A1F 燚	B
17E8D	燚						WH 3 8.162* TY A 41A38 TY B2 41B14	to pull [ndźwə]	[17A73] [燚]	B
171E5	茄						WH 1 39.261* TY A 45A66 TY B2 45B62	inclined to one side	[17A1F] [燚]	B
17212	靐						TY A 23A47 TY B2 24A32	elbow [kẹɯ]	[171E5] [茄]	B
17223	靐						WH 1 39.261* TY A 23A48 TY B2 24A33	slanting [kẹɯ]	[171E5] [茄] [17A1F] [燚]	B

Group 26: Chain of 3 characters
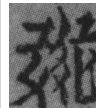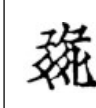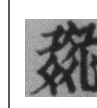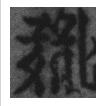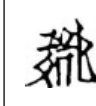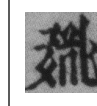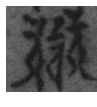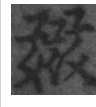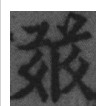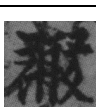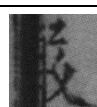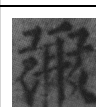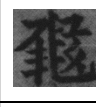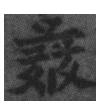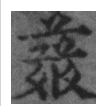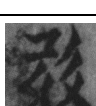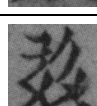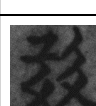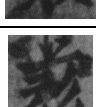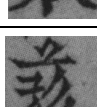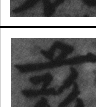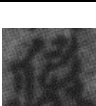
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1815A	爻				爻		WH 1 50.241 TY A 18A13 TY B2 18B38	a surname [ndai]	1817A 爿	B
1817A	爿				爿		WH 1 50.242 TY A 18A14 TY B2 18B41	a kind of grass [nai]	1815A 爻	B
18170	爿				爿		WH 1 10.272 TY A 42B63 TY B2 43B16	a surname [·u]	1815A 爻	B

Group 27: Chain of 8 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1814E	爿				爿		WH 1 8.141* TY A 51B46 TY B2 52A12	happy [ldʐ]		B
1815D	爿				爿		WH 1 8.141* TY A 49B62 TY B2 50A54 WHYB 63.19	to celebrate [lị̯wu]	1814E 爿	B
1813D	爿				爿		WH 1 8.121* TY A 27A11 TY B2 27B33 WHBY 84.310	good [ngạ]	1814E 爿	B
1814D	爿						WH 1 68.142 TY A 51B18 TY B1 51B78	time [źi̯ẹ]	1813D 爿	B
18134	爻					爻	WH 1 17.221 TY A 29B11 TY B2 30A42	to desire [tshi]	1813D 爿	B
18167	爿				爿	爿	WH 1 18.161 TY A 24B57 TY B2 25B35	honorable [kwi]	18134 爻	B
17BCB	爿				爿		TY A 02B38 TY B1 03B35	penis [mbɪn]	[1813D] [爿]	B
18143	爿						WH 1 45.121* TY A 27A12 TY B2 27B34	many [ngạ]	[1813D] [爿]	B

Group 28: Chain of 10 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1815E	𘅞						WH 1 83.271* TY A 18A56 TY B2 18B74	face [nie̯]		B
18152							WH 1 71.132 TY A 51B35 TY B2 52A27	forehead [li̯a]	1815E	B
18161							WH 1 50.172 TY A 29A16 TY B2 35A53	evidence [si̯e]	left: 18152 right: 1815E	B (l) B (r)
18151							WH 1 15.153* TY A 06B14 TY B5 07A64 TYWH-C A42	ashamed [mbon]	1815E	B
175C1							WH 1 36.223 TY A 38A77 TY B2 38B74	ashamed [śi̯ə]	18151	B
18187							TY A 52A54 TY B2 52B36	shame [lɪn]	[175C1]	B
1750B							WH 1 59.223 TY A 06B15 TY B2 10A52	a surname [mbon]	18151	B
18133							WH 1 41.273 TY A 51B43 TY B2 52A38	ashamed [li̯ə]	18151	B
1748C							WH 1 41.272 TY A 51B44 TY B2 52A37	a surname [li̯ə]	18133	B
17B93							WH 1 6.132* TY A 51B27 TY B2 52A25 WHBY 74.18	to detest [ldi̯ə]	18133	B

Group 29: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1737C	祧						WH 1 36.152* TY A 10A28 TY B2 11A28 TYWH-A 02.222	face [vi̯ei]	1737E 祧	B
1737E	祧				祧		TY A 10A31 TY B2 11A31 TYWH-A 02.223	a surname [vi̯ei]	1737C 祧	B
1814A	蔬				蔬	蔬	WH 1 43.151 TY A 50A68 TY B2 50B58	a surname [lei]	1737E 祧	B
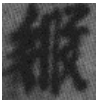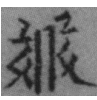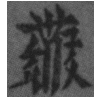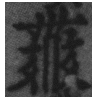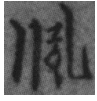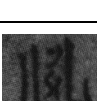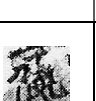
Group 30: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17115	羴					羴	WH 1 79.222* TY A 40B61 TY B2 41A35	to take out [śi̯ei]		B
17775	蕼						WH 1 44.271 TY A 43A16 TY B2 43B41	stake [·êi]	17115 羴	B
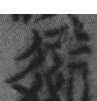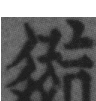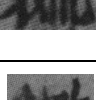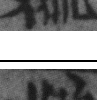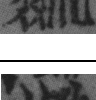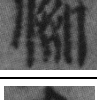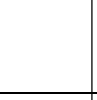
Group 31: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1813F	裻				裻	裻	WH 1 68.251* TY A 15B36 TY B2 16B24	chapter [tɪn]		B (left) B (right)
174F1	裻						TY A 15B37 TY B2 16B25	if [tɪn]	[1813F] [裻]	B (left) B (right)
17799	蕼				蕼	蕼	WH 1 48.231 TY A 19B52 TY B2 20A61	small cup [twɪn]	1813F 裻	B

Group 32: Chain of 5 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1802F	姵						WH 1 64.272* TY A 08B73 TY B2 09B28	to spread [ma̱]		B
1778F	薇						WH 1 63.222 TY A 19B14 TY B2 20A26	a tongue of flame [nwṵ]	1802F 姵	B
171C4	凬						WH 1 64.272* TY A 05A25 TY B5 06A18	to spread [me̱i]	[1802F] [姵]	B
176C6	蔵						WH 1 54.113* TY A 10B74 TY B2 11B75 TYWH-A	branch [wa̱]	171C4 凬	B
177DB	嘨						WH 1 13.171* TY A 07A11 TY B2 07B56	leaf [mba̱]	[176C6] [蔵]	B

Group 33: Chain of 6 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17A74	緂						WH 1 11.253* TY A 12A34 TY B2 13A23 TYWH-A 06.033	good [nəɯ]	17AD1 緤	B
17AD1	緤						WH 1 18.221* TY A 12A64 TY B2 13A61 TYWH-A 06.113	livestock [ni̱u]	17A74 緂	B
171BE	燀						WH 1 67.273 TY A 26A61 TY B2 27A24	inferior [ngi̱e]	17A74 緂	B
17510	齏						WH 1 67.273* TY A 18A34 TY B2 18B55	kind [ni̱u]	[17A74] [緂]	B
17662	禰						TY A 11B36 TY B2 12A65 TYWH-A	a transliteration [wan]	17A74 緂	B
17AE4	綷						WH 1 41.232* TY A 12A65 TY B2 13A62 TYWH-A	many [ni̱u]	17AD1 緤	B

Group 34: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18159	𗈩						WH 1 86.122* TY A 53B32 TY B6 53B66	mark [rʱa]		B
17BC8	𗯈						WH 1 72.221 TY A 10A23 TY B2 11A24	trace [vi̯ei]	18159 𗈩	B/A
18164	𘃤						WH 1 86.122 TY A 53B33 TY B6 56B23	to write [rʱa]	18159 𗈩	B

Group 35: Chain of 2 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18156	𘀜						WH 1 42.121 TY A 09A51 TY B2 09B71	to tie up; to jump [mbi̯ə]		B
18139	𗿋						WH 1 49.243* TY A 52A63 TY B2 52B44 WHBY 76.43	to jump [lɪn]	left: 17DAE 𗶮 right: 18156 𘀜	B (l) B (r)

Group 36: Chain of 11 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18590	𘖐						WH 1 37.231* TY A 03B27 TY B1 04B18	fire [mɪ]		B
18591	𘖑						WH 1 37.231 TY A 03B24 TY B1 04B24	not [mɪ]	18590 𘖐	B
1858B	𘖋						WH 1 34.153 TY A 27A51 TY B2 29B18	fatness [ngə]	18591 𘖑	B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
1858D	𘖍						WH 1 20.133 TY A 22A32 TY B5 22B78	to beg [ngie̯]	18591 𘖋	A/B
1858E	𘖎						WH 1 66.161 TY A 10A78 TY B2 12B53	short [vie̯]	18591 𘖋	B
1858F	𘖏						WH 1 37.241 TY A 03B31 TY B5 04B25	right now [mɪ]	18591 𘖋	B
18595	𘖕						WHI I 58.152 TY A 34A65 TY B2 34B63	restless [tsi̯o]	18591 𘖋	B
18596	𘖖						WH 1 37.242 TY A 03B28 TY B5 04B26	mother [mɪ]	18591 𘖋	B
1858A	𘖊						WH 1 37.141* TY A 03B25 TY B5 04B17	footmark [mɪ]	[18591] [𘖋]	B
18592	𘖒						TYWH-A 01.111 TY A 09A68 TY B2 10A18	to investigate [mi̯ə]	1858A 𘖊	B
1858C	𘖌						WH 1 77.172* TY A 03B21 TY B5 04B14	naughty children [mɪ]	[18591] [𘖋]	B
18593	𘖓						WH 1 54.112* TY A 53B56 TY B6 54A17	to break [li?]		B
18594	𘖔						WH 1 66.171* TY A 41A18 TY B2 41A64	to shrink [śwâ]		B
18597 18598	𘖗 𘖘						WH 1 68.241* TY A 35B72 TY B2 36B31	to rescue [ndźêi]		B

Group 37: 20 unchained characters
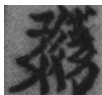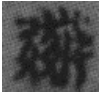
C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
173F2	𗏲						TY A 06B72 TY B2 10A66	a surname [phwei]		B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
17859	矙						WH 1 69.111* TY A 42B54 TY B2 43A77	to extol [·ôn]		A/B
18012	譝						WH 1 68.111* TY A 36A53 TY B2 37A11	name of a star [ndźân]		B
18132	孬						WH 1 50.231* TY B6 56A28	to stop [li̯ə]		B
18138	羏						TY A 18A57 TY B2 19A11	to do [ni̯e]		B
18140	孱						TY A 19A41 TY B2 19B55	to rebel against		B
18141	荒						WH 26.242* TY A 48B12 TY B2 48B67	to ask for help [rẹ]		B
18142	孥						TY B2 52A28	thatched shed [li̯a]		B
18150	雦						WH 1 27.171* TY A 04B61 TY B5 05B54	boots wearing in rain or snow [phu]		B
18158	雧						TY A 18A58 TY B2 19A12	to spread [ni̯e]		B
1815B	雼						TY A 21A16 TY B2 21B66	to bow [ki̯u]		B
1815C	孲						WH 1 75.231* TY A 15B21 TY B2 16A73	to change [ndi̯e]		B
1815F	彌						TY A 29A78 TY B2 30A43	to drive [tshi]		B
18172	薇						WH 1 57.112* TY A 29A77 TY B2 30A47	general [tshi]		B
18173	雗						TY B2 30A44	a surname [tshi]		B

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent	Type
18177	𘅀						WH 1 11.141* TY A 18A55 TY B2 18B76	servant [ni̯e]		B
18179	𘅁						WH 1 70.172* TY A 18A61 TY B2 18B75	west [ni̯e]		B
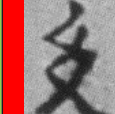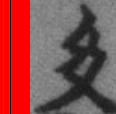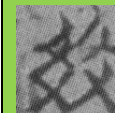
6.3 Evidence from Other Sources

In order to check whether the distinction between Type A and Type B glyph forms shown in the tables in Sections 6.1 and 6.2 are maintained throughout the Tangut corpus, this section provide a sample of 36 characters with Component 267 and 28 characters with Component 316 from a range of different types of texts dating from the Western Xia, Yuan and Ming periods.

- **SSMY.** *Collected Writings of the Shining Speech of Three Generations* (*Sānshìshǔ míngyán jíwén* 三世屬明言集文), a Western Xia Buddhist text printed using movable type

- **TM.** *Homonyms* (*Zéyào chángchuán tóngmíng zázì* 擇要常傳同名雜字), a Western Xia xylographic edition of a linguistic text

- **YY.** *Proverbs* (*Yànyǔ* 諺語), a Western Xia xylographic edition of a secular literary text (colophon dated 1187)

- **Odes.** *Odes* (*Shī* 詩), a Western Xia xylographic edition of a secular poetic text (colophons dated 1185–1187)

- **LL.** *Forest of Categories* (*Lèilín* 類林), a Western Xia xylographic edition (colophon dated 1181)

- **SJ.** *Newly Collected Grains of Gold Placed in the Palm Text* (*Xīnjí suìjīn zhìzhǎngwén* 新集碎金置掌文), a Western Xia hand-written text

- **HYJ.** *Avataṃsaka Sūtra* (*Dàfāngguǎng fó huáyán jīng* 大方廣佛華嚴經), a xylographic edition of a Buddhist sutra thought to have been printed during the Yuan dynasty

- **JYG.** Yuan dynasty Buddhist inscriptions at Juyong Pass, dated 1345

- **BD.** Ming dynasty dhāraṇī pillar inscriptions at Baoding, dated 1502

The characters in the tables below are colour-coded to indicate whether or not the glyph form corresponds to the expected glyph type (A or B): green indicates that it is the expected glyph type; red indicates that it is an unexpected glyph type; and yellow indicates that the glyph type is unclear or ambiguous, or that both A and B types are attested.

A. Component 267 (36 characters)

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
17F86 170D0 炙 夊 Type A									
17F95 燚 Type A									

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
184F1 (swallow) Type A									
17FA4 Type A									
17F87 Type A									
17FE6 Type A									
17585 Type A									
17C62 Type A									
17FFC Type A									
17AC2 Type A									
17565 Type A									

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
17FFA 孋 Type A		🟩			🟩				
18164 頫 Type A		🟩		⬜	🟨				🟩
186A2 虮 Type A	🟥		🟥	🟨	🟨	🟩	🟩		
17F94 㽰 Type A and B		🟩	🟥		🟩		🟨🟨		
1766B 襺 Type B		🟩						🟥	🟥
17C17 祋 Type B	🟩	🟩	🟩	🟩	🟩	🟩	🟥		🟩
17F88 攸 Type B		🟩	⬜		🟩	🟩	🟥		
18736 㪠 Type B	🟩	🟩	🟩	🟩	🟩	🟩	🟨🟨		🟩
17FD2 緤 Type B		🟩	🟩	🟩	🟩	⬜			
183E8 㪯 Type B	🟩	🟩	🟩	🟩	🟩	🟩	🟥		

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
1734F 𗓏 Type B					🟩	🟩		🟥	🟥
1734A 𗓊 Type B	🟩		🟩	🟩	🟩	🟩	🟨🟨		
17A86 𗪆 Type B	🟩	🟩	🟩	🟩	🟩		🟥		
17F94 𗾔 Type B	🟩	🟩	🟩	🟩	🟩	🟩			
17F9E 𗾞 Type B	🟩		🟩	🟩	🟩	🟩			🟥
17F96 𗾖 Type B	🟩	🟩	🟩	🟩	🟩	🟩			
184F1 𘓱 (heaven) Type B	🟩	🟩	🟩						
17CE5 𗳥 Type B	🟩	🟩	🟩						
18783 𘞃 Type B							🟥		🟩
17232 𗈲 Type B	🟩	🟩	🟩	🟩	🟩				

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
17FE2 嶬 Type B									
1822C 㹸 Type B									
186DB 㲠 Type B							 		
174B7 �态 Type B									
17FF3 㶨 Type B									

B. Component 316 (28 characters)

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
175D8 㣮 Type A									
17912 㹡 Type A									
18147 㲠 Type A									

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	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
17A2C Type A		𗨬	𗨬	𗨬		𗨬			
1733B Type A		𗌻		𗌻	𗌻				
1781D Type A	𗠝	𗠝			𗠝		𗠝	𗠝	
18354 Type A	𘍔	𘍔	𘍔	𘍔	𘍔	𘍔			
184D7 Type A		𘓗	𘓗						
185E0 Type A	𘗠		𘗠	𘗠	𘗠		𘗠		
181D2 Type A		𘇒	𘇒	𘇒	𘇒	𘇒			
1813E Type A		𘄾							
17D85 Type A		𗶅				𗶅			
174D1 Type A	𗓑	𗓑				𗓑			

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
174B1 𗓱 Type A		𗓱			𗓱				
17DB2 𗖲 Type B		𗖲	𗖲 𗖲		𗖲 𗖲				
1813F 𘄿 Type B	𘄿		𘄿	𘄿	𘄿		𘄿	𘄿	𘄿
174F1 𗓱 Type B	𗓱			𗓱	𗓱	𗓱	𗓱		
1814D 𘅍 Type B	𘅍	𘅍	𘅍		𘅍	𘅍	𘅍		
18134 𘄴 Type B	𘄴	𘄴	𘄴	𘄴	𘄴	𘄴			
1816B 𘅫 Type B								𘅫 𘅫	
18133 𘄳 Type B							𘄳		

	SSMY	TM	YY	Odes	LL	SJ	HYJ	JYG	BD
18144 𗙪 Type B									
1813D 𗄱 Type B									
1814E 𗅎 Type B									
1814B 𗅋 Type B									
1812F 𗄯 Type B									
18591 𘖑 Type B									
1858E 𘓎 Type B									

6.4 Evidence for Component 087

Group 1: Chain of 5 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
175F2	㺱		㺱	㺱			TY A 28A66 TY B2 28B73 TYWH-A 15.72	to butcher [khhi]	175F5 㺵
175F5	㺵		㺵	㺵	㺵	㺵	TY A 26A45 TY B2 27A13 TYWH-A 10.122	yak [khê]	175F2 㺱
175F6	**㺶**	㺶	㺶	㺶			WH 1 22.162 TY A 16B26 TY B2 17A71	tail [ta]	175F5 㺵
175F9	㺹		㺹	㺹		㺹	TY A 40A47 TY B2 40B27 WHBY 70.38	bellyband [śi̯wa]	175F5 㺵
177D9	㻙	㻙	㻙	㻙	㻙		WH 1 87.232 TY A 18B11 TY B2 19A28	to burn [thwə̣]	175F2 㺱

Group 2: Chain of 3 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
175F6	**㺶**	㺶	㺶	㺶	㺶	㺶	WH 3 7.273* TY A 19A74 TY B2 20A16	fox [nə]	
175F1	㺱		㺱	㺱	㺱	㺱	TY A 38A61 TY B2 38B53	fox [ndźâ]	[175F6] [㺶]
175FD	㺽	㺽		㺽	㺽		WH 3 08.111 TY B2 38B54	a surname [ndźâ]	175F1 㺱

Group 3: Chain of 18 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
175FF	㺿	㺿	㺿	㺿	㺿		WH 1 22.161 TY A 16B27 TY B2 17A68	dog [ta]	17602 㺵

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
17604	孩				孩		WH 1 22.152 TY A 16B25 TY B2 17A66	maggot [ta]	175FF 孩
175FB	獭					獭	WH 1 22.241 TY A 12A23 TY B2 13A15	year of dog (*xu*) [na]	17602 獭
175FC	獭						WH 1 22.242 TY A 12A24 TY B2 13A16	wizard [na]	175FB 獭
17603	獭						WH 1 22.251 TY A 12A25 TY B2 13A17	buttocks [na]	175FB 獭
178B0	攴				攴		WH 1 22.232 TY A 12A27 TY B2 13A14	a surname [na]	175FB 獭
175FA	翅				翅	翅	WH 1 42.241 TY A 51B23 TY B2 52A22	wolf [li̯ə]	175FB 獭
175EF	死				死	死	TY A 36A12 TY B2 36B44 WHBY 75.13	dog [tṣ́i̯ei]	175FB 獭
17602	獭				獭	獭	WH 1 39.263 TY A 25A16 TY B2 25B62	dog [khwɪ]	175FB 獭
175F0	殍				殍		TY A 25A17 TY B2 25B64	a kind of grass [khwɪ]	[17602] [獭]
175F3	殍						TY A 25A18 TY B2 25B65	dirty [khwɪ]	[17602] [獭]
175F4	殍						WH 1 40.211 TY A 34B13 TY B2 35A12	to bark [tshwɪ]	17602 獭
17601	獭						WH 1 82.152 TY A 48B22 TY B2 49A34	to bark [rẹ]	17602 獭
175F7	殍						TY A 12B48 TY B2 13B37 TYWH-A 06.212	noise [ni̯e]	17602 獭

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
17606	殯						TY A 27A25 TY B2 27B47	transliteration of Chinese 'dog' (狗 *gǒu*) [keu]	[17602 or 175FB] [殰 or 殲]
17600	殰						TY A 27A27 TY B2 27B48	chrysalis [keu]	[17606] [殯]
17777	殯						TY A 27A26 TY B2 27B51	fruit of the Chinese wolfberry [keu]	[17606] [殯]
176BE	蔽						TY A 22A51 TY B2 23A28	fruit of the Chinese wolfberry [khi]	[17777] [殯]

Group 4: Chain of 4 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
175FE	殲						WH 1 24.172 TY A 10B68 TY B2 11B67	pig [wa]	17605 殲
175F8	殲						WH 1 24.173 TY A 10B67 TY B2 11B68	eddy [wa]	175FE 殲
17605	殲						WH 1 09.161 TY A 23A25 TY B2 24A11	year of pig (*hai*) [ngi̯u]	175FE 殲
17607	殲						TYWH-A 21.022	transliteration of Chinese 'pig' (猪 *zhū*) [tśi̯u]	17605 殲

Group 5: Chain of 4 characters

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
17ED0	緻						TY A 07B48 TY B2 08A78	kind of grass [mbu]	
17D9F	緻						WH 1 11.121 TY A 07B47 TY B2 10A37	etiquette [mbu]	17ED0 緻

C/P	Glyph	WH	TY A	TY B	ZZ	ZZZ	Refs.	Meaning	Parent
17EF9	繓						WHBY 10.75	kind of tree [mbu]	[17D9F] [盛]
180A8	繓	![]	![]	![]			WH 1 49.122 TY A 08B31 TY B2 09A58	a surname [mbai]	17D9F 盛