Positional Mismatches in Mongolian Encoding | 蒙系文字编码中的位置失配

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This document discusses the problems of positional mismatches that exibit in the current Mongolian encoding of the Unicode Standard. It is argued that these mismatches should be rectified at a later point, and a full list of mismatches is given.

本文讨论现行 Unicode 标准中蒙系文字编码中的位置失配问题，提议今后时机适当时应当修正这些失配，并给出了失配全表。

0 Preliminary notes | 预备性说明

Owing to the pervasive editorial errors in the transfer of the variant specification from StandardizedVariants.html (henceforth SV.html) to the code charts since Unicode 7.0, the Mongolian variant specification in the present discussion is based on SV.html, the Mongolian section of which has remained unchanged from beginning (Unicode 3.2) to end (Unicode 8.0). We shall not blame the editors as SV.html did not overtly list no-FVS forms, and when attempting to recover these forms in the code charts, errors are almost inevitably made on whether there is a no-FVS form and what it is. In view of this, I have resorted to TR170, the document most conforming to SV.html yet having a full specification of the variants, for the no-FVS forms. A full chart of the Mongolian variant specifications in TUS without editorial errors is given in Appendix A.

7.0 版以降的 Unicode 标准将变体的规定从 StandardizedVariants.html（以下简称 SV.html）转移到了码表中，可惜这个过程充斥了大量的编辑错误。故本文讨论的蒙系文字变体规定一以 SV.html 为准，因为 SV.html 关于蒙系文字的规定从头（Unicode 3.2）到尾（Unicode 8.0）都保持了一致。我们不应该非难编辑；事实是 SV.html 本来就没有列出无 FVS 形，故而想要在码表中补出无 FVS 形时，弄错到底有没有无 FVS 形以及无 FVS 形是什么就在所难免。鉴于此，笔者参考了 TR170 来补正无 FVS 形，因为 TR170 与 SV.html 最为吻合并且列全了所有的变体。剔除了编辑错误的 Unicode 中蒙系文字变体规定全表列在附录 A 中。

In addition, it should be noted that the correspondence between SV.html and TR170 is based on FVS assignments rather than on the names of variants. There are several naming discrepancies between SV.html and TR170: to name a few, "1st medial" and "2nd medial" are swapped for U+1825, U+1826, and U+1836 respectively. Therefore it is rather confusing to refer to the variants by their names, and labels "no-FVS", "FVS1", "FVS2", and "FVS3" are used instead throughout this paper.

此外，要注意 SV.html 和 TR170 的一致是体现在 FVS 的指派上，而不是体现在变体名称上。两份文档之间有好几处变体名的差异，譬如 U+1825、U+1826、U+1836 的「中 1 形」「中 2 形」是对调的。故而用名字指称变体让人头大，本文称说一律用「无 FVS 形」「FVS1 形」「FVS2 形」「FVS3 形」等。

1 Introduction | 引子

The **positional mismatch** to be discussed in this paper is the mismatch between the genuine cursive *glyph types* (cursive positions) of Mongolian variant forms and the stipulated counterparts in the current Unicode Standard. These positional mismatches are problems inherited since the finalizing of the Mongolian encoding project, but various implementations (notably the three major shaping engines Uniscribe/DirectWrite, HarfBuzz, and Core Text) have ever since unanimously assumed the genuine positions disregarding the standard. Having suffered from the headache caused by the mismatch for ages, the W3C Mongolian mailing list agreed upon the identification of 7 notorious mismatch cases in 2015, and were going to ask the UTC to fix them, but the proposal unfortunately came to nothing in the end. Nevertheless, the gist of the proposal is embodied in their latest documents (L2/17-124 and L2-17/128).

本文讨论的**位置失配**指的是蒙系文字变体真正的图形类（连写位置）和现行 Unicode 标准规定的之间的失配。这个问题自蒙系文字编码定案以来就一直存在，但诸多实现例（尤其是三大变形引擎 Uniscribe/DirectWrite、HarfBuzz、Core Text）一直就弃标准于不顾，一致用的是真连写位置。在经年忍受了失配造成的不便之后，W3C 蒙系文字邮件列表在 2015 年检定了 7 个著名的失配例子，拟请求 UTC 将其修正，但该提案最后无疾而终。不过，提案的要旨体现在了他们新近的文档中（L2/17-124 和 L2-17/128）。

These 7 noted cases of positional mismatches are:

这 7 例广为人知的位置失配是：

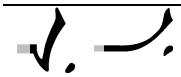
Glyph[1]	Code point	Xlit.	Current spec.	Usage	Proposed change[2]
图形 [1]	码位	转写	现行标准	用法	提议的改法 [2]
	1820	*a*	FVS2 medial | FVS2 中形	Post-NNBSP | NNBSP 后	FVS1 initial | FVS1 上形
	1828	*n*	FVS2 medial | FVS2 中形	Pre-MVS or word-final | MVS 前或词末	FVS1 final | FVS1 下形
	182C	*x*	FVS2 medial | FVS2 中形	Pre-MVS (archaic) | MVS 前（古体）	FVS1 final | FVS1 下形
	182C	*x*	FVS3 medial | FVS3 中形	Pre-MVS | MVS 前	No-FVS final | 无 FVS 下形
	182D	*g*	FVS2 medial | FVS2 中形	Pre-MVS | MVS 前	FVS3 final | FVS3 下形
	1835	*ǰ*	FVS1 medial | FVS1 中形	Pre-MVS (archaic) | MVS 前（古体）	FVS1 final | FVS1 下形
	1836	*y*	FVS2 medial | FVS2 中形	Pre-MVS | MVS 前	No-FVS final | 无 FVS 下形

Table | 表 1

a's FVS2 medial occurs only after NNBSP, as the first letterform in the Hudum Mongolian ablative enclitic *-ača*  /  . The remaining 6 cases are characterized by their occurring nearly solely before MVSes. In particular, *n*'s FVS2 medial is mostly used in Hudum as an onset consonant before a MVS, as in Hudum *ün_e*  /  "price", but is also used in transcribing loan words occasionally both in Hudum and Manchu, as in Manchu *han"*  /  (transcription of Mandarin syllable *han*). As the glyphs suggest, these 7 forms either end (*a*'s FVS2 medial) or begin (the other 6 cases) in a cursively disjoined stroke, and are intuitively cursively initial or final respectively rather than

[1] The Mongolian script is rendered first in printing style (White) and then in handwriting style (Hawang) throughout this paper. | 蒙系文字本文中一律依次给出印刷体（白体）和手写体（哈旺体）。

[2] As agreed upon in the W3C Mongolian mailing list (public-i18n-mongolian@w3.org). See https://lists.w3.org/Archives/Public/public-i18n-mongolian/2015JulSep/0273.html. | 在 W3C 蒙系文字邮件列表（public-i18n-mongolian@w3.org）中取得了共识。见 https://lists.w3.org/Archives/Public/public-i18n-mongolian/2015JulSep/0273.html。

medials.

a 的 FVS2 中形只出现在 NNBSP 后，是胡都木蒙古文离格附着词 *-ača*  的第一个字形。其他六例的特点是几乎只出现在 MVS 之前。具体讲，*n* 的 FVS2 中形一般是在胡都木文里用作 MVS 之前的音节首辅音，如胡都木文 *ün_e*  「价」，但也在胡都木文和满文中偶尔用于转写借词，如满文 *han"* （转写普通话音节 *han*）。一看便知，这七个字形或者开头（*a* 的 FVS2 中形）或者结尾（其他六例）笔划不连，直觉上就是连写上形或下形而非中形。

2 Problems | 问题

2.1 Contradicting the general Arabic cursive joining rules and complicating the implementation | 与一般的阿拉伯连写规则冲突，实现更复杂

The first argument for wiping out the mismatches is that they contradict the general cursive-joining rules of the standard. The general cursive joining rules of Mongolian, as specified under the heading of *Cursive joining*, is essentially identical to the Arabic cursive-joining rules, an equivalent simplified version of which is illustrated below:[3]

扫除失配的第一条理由是其与 Unicode 标准中一般的连写规则冲突。蒙系文字一般的连写规则在连写一小节有规定，实质上无异于阿拉伯连写规则。下面给出了阿拉伯模型的一个等效的简化版：[3]

R4:	Dual_Joining → Dual_Joining.medi / {Dual_Joining, Join_Causing} __ {Dual_Joining, Join_Causing}
R5:	Dual_Joining → Dual_Joining.init / __ {Dual_Joining, Join_Causing}
R6:	Dual_Joining → Dual_Joining.fina / {Dual_Joining, Join_Causing} __
R7:	Dual_Joining → Dual_Joining.isol

Being mutually exclusive, the transformational rules R4~R7 apply in this disjunctive order. For example, R5 applies only when R4 is not applicable and the contextual condition of R5 is satisfied, and its application in turn blocks R6 and R7.

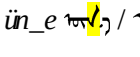
转换规则 R4~R7 是互斥的，并按照指定的顺序施用。譬如，只有当 R4 不施用并且 R5 的语境条件满足时 R5 才施用，并且其施用阻断了 R6 和 R7。

Let's apply the Arabic cursive joining rules to the above-mentioned mismatch cases.

下面就对上面提到的失配例子施用阿拉伯连写规则。

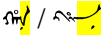
-ača  ：

Code point | 码位	202F	1820	1834	1820
Char. name | 字符名	NNBSP	ML. A	ML. CHA	ML. A
Joining type | 连写类型	Non_Joining	Dual_Joining	Dual_Joining	Dual_Joining
Joining rule | 连写规则		R5	R4	R6
Arabic position | 阿拉伯位置		Initial | 上形	Medial | 中形	Final | 下形
Post-shaping glyph | 变形后图形				
				
Mismatched position | 失配后位置		Medial | 中形	(No mismatch) | （无失配）	(No mismatch) | （无失配）

ün_e  ：

[3] Joining types Left_Joining, Right_Joining and Transparent, which are largely irrelevant here, are omitted in the formulation. | 连写类 Left_Joining、Right_Joining、Transparent 在此基本不相干，描述中不涉及。

Code point | 码位	1826	1828	180E	1821
Char. name | 字符名	ML. UE	ML. NA	MVS	ML. E
Joining type | 连写类型	Dual_Joining	Dual_Joining	Non_Joining	Dual_Joining
Joining rule | 连写规则	R5	R6		R7
Arabic position | 阿拉伯位置	Initial | 上形	Final | 下形		Isolate | 单形
Post-shaping glyph | 变形后图形				
				
Mismatched position | 失配后位置	(No mismatch) |（无失配）	Medial | 中形		Final | 下形[4]

han"  :

Code point | 码位	1865	1820	1828	180C
Char. name | 字符名	MLS. HA	ML. A	ML. NA	FVS2
Joining type | 连写类型	Dual_Joining	Dual_Joining	Dual_Joining	Transparent
Joining rule | 连写规则	R5	R4	R6	
Arabic position | 阿拉伯位置	Initial | 上形	Medial | 中形	Final | 下形	
Post-shaping glyph | 变形后图形				
				
Mismatched position | 失配后位置	(No mismatch) |（无失配）	(No mismatch) |（无失配）	Medial | 中形	

The original cursive joining rules are fairly intuitive, and various implementations have stuck to the general Arabic model. However, the original simplicity is disrupted as two bizarre provisions are introduced later in the section of Mongolian when addressing NNBSP and MVS, which read:

原本的连写规则很合直觉，诸多实现例也一直采用的是阿拉伯模型。但蒙系文字一节中论及 NNBSP 和 MVS 时增加了两条奇怪的条款，打破了这个简单的局面：

> NNBSP affects the form of the preceding and following letters. The final letter of the stem or suffix preceding the NNBSP takes the final positional form, whereas the first letter of the suffix following NNBSP may take the normal initial form, a variant initial form, a medial form, or a final form, depending on the particular suffix. (Core Spec. of Unicode 10, p. 534)
>
> NNBSP 影响前后字母的变形。NNBSP 前词干或后缀的末字母取下形，NNBSP 后后缀的首字母可能取中形、下形、正常或变化的上形，依后缀而不定。（Unicode 10 核心规定，534 页）
>
> The MVS has a twofold effect on shaping. On the one hand, it always selects the forward tail form of a following letter *a* or *e*. On the other hand, it may affect the form of the preceding letter. The particular form that is taken by a letter preceding an MVS depends on the particular letter and in some cases on whether traditional or modern orthography is being used. (ibid., p. 535)
>
> MVS 对变形有两个影响。其一，总是选择其后字母 *a* 或 *e* 的左尾形。其二，也会影响前面字母的变形：MVS 前字母所取的具体字形要看具体字母，有时还取决于用的是传统正字法还是现代正字法。（同上，535 页）

These two provisions open up the possibility of positional mismatch. But is such stipulation desirable from a technical perspective? Not at all. If one were to faithfully implement this scheme, they would postulate additional rules preempting the general rules, which should be built into the shaping engine in an OpenType framework:

这两条给位置失配开了后门。但这种规定从技术上看有必要吗？完全多此一举。假使要原原本本实现这个方案，就得新设规则抢在一般规则的前面，在 OpenType 框架里这些规则要写进变形引擎里：

[4] The disjoint tail is another case of mismatch to be addressed later in this paper. | 分尾是又一例错配，下文将论及。

a → *a*<medi> / NNBSP __ {Dual_Joining, Join_Causing}
n → *n*<medi> / {Dual_Joining, Join_Causing} __ {FVS2, MVS}
x → *x*<medi> / {Dual_Joining, Join_Causing} __ MVS
x → *x*<medi> / {Dual_Joining, Join_Causing} __ FVS3 MVS
g → *g*<medi> / {Dual_Joining, Join_Causing} __ MVS
ǰ → *ǰ*<medi> / {Dual_Joining, Join_Causing} __ MVS
y → *y*<medi> / {Dual_Joining, Join_Causing} __ MVS

However, as the rules above would serve only tagging the glyphs with positional features, the font designers would still need to partially duplicate these rules in the GSUB table as below, so as to specify the required specific variants within the underdetermined variant paradigms:

可是，上面这些规则只能给图形挂上位置特征，字体设计者仍旧还要把这些规则的一部分在 GSUB 表里重复一遍，才能在未确定的变体集合中指定出所需的字形：

a<medi> → *a*.medi.FVS2 / NNBSP __
n<medi> → *n*.medi.FVS2 / __ {FVS2, MVS}
x<medi> → *x*.medi.FVS2 / __ MVS
x<medi> → *x*.medi.FVS3 / __ FVS3
g<medi> → *g*.medi.FVS2 / __ MVS
ǰ<medi> → *ǰ*.medi.FVS1 / __ MVS
y<medi> → *y*.medi.FVS2 / __ MVS

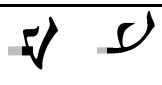
That being the case, it is obvious why no engine would follow the standard. No one would favor a two-step scheme that can be equivalently carried out in one go.

这样一来，为什么没有引擎按照标准来就显而易见了。等价在一步里能做完的事哪会有人分成两步去做。

2.2 Contradicting both users' intuition and the grammatical tradition | 与用户直觉及语法传统相悖

Things get worse when this complication is exposed to users in metalanguage, where one may wish to render these mismatched variants out of context. If one wants to list all pre-MVS consonant forms with MVS absent, they are faced with the following paradigm of representation:

到了元语言用法里，用户可能想孤立地显示失配变体，那么编码的复杂之处就要甩给用户了，这比上面的情况更加不堪。如果要打出 MVS 前辅音字形又不让 MVS 出现，把表征方法列出来是这样的：

Xlit. 转写	Current spec. 现行规定	Char. sequence 字符序列	Glyph 图形
m	No-FVS final | 无 FVS 下形	ZWJ, __	
l	No-FVS final | 无 FVS 下形	ZWJ, __	
s	No-FVS final | 无 FVS 下形	ZWJ, __	
	FVS1 final | FVS1 下形	ZWJ, __, FVS1	
š	No-FVS final | 无 FVS 下形	ZWJ, __	
r	No-FVS final | 无 FVS 下形	ZWJ, __	

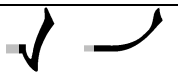
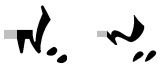
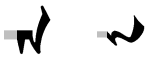
w	FVS1 final | FVS1 下形	ZWJ, __		
n	FVS2 medial | FVS2 中形	ZWJ, __, FVS2, **ZWJ**		
	No-FVS final | 无 FVS 下形	ZWJ, __		
g	FVS2 medial | FVS2 中形	ZWJ, __, FVS2, **ZWJ**		
	No-FVS final | 无 FVS 下形	ZWJ, __		
x	FVS2 medial | FVS2 中形	ZWJ, __, FVS2, **ZWJ**		
	FVS3 medial | FVS3 中形	ZWJ, __, FVS3, **ZWJ**		
ǰ	FVS1 medial | FVS1 中形	ZWJ, __, FVS1, **ZWJ**		
y	FVS2 medial | FVS2 中形	ZWJ, __, FVS2, **ZWJ**		

Table | 表 2

Not only are letters that occur before MVS divided into unmismatched (*m, l, s, š, r, w*) and mismatched (*x, ǰ, y*) ones, but discrepancies arise within a single letter (*n, g*) as well, though the variants of *n* and *g* in question differ only in dotting. This highly irregular pattern defies all mnemonics.

不光 MVS 前能出现的字母要分成无失配的（*m*、*l*、*s*、*š*、*r*、*w*）和有失配的（*x*、*ǰ*、*y*），单个字母之内还有歧异（*n*、*g*），哪怕 *n*、*g* 两字母所涉的变体区别只在于加点与否。这么不规则的格局不知叫人怎么记诵。

It is more irrational that the first letterform in the masculine ablative enclitic *-ača*  /  is stipulated as medial yet the first letterform in the feminine ablative enclitic *-eče*  /  remains initial, though the two forms are identical in all styles. Owing to the mismatch, one has to type <*e, č, e*> for *-eče* while <**ZWJ**, *a*, FVS2, *č, a*> for *-ača*. Jirimutu has commented in the W3C Mongolian mailing list as follows:[5]

更加没道理的是，阳性离格附着词 *-ača* / 的第一个字形被定为中形，而阴性离格附着词 *-eče* / 的第一个字形仍旧是上形，须知这两个形在任何书体风格里都是同形的。拜失配所赐，*-eče* 仍旧打成<*e, č, e*> 但*-ača* 却成了<**ZWJ**, *a*, FVS2, *č, a*>。吉日木图在 W3C 蒙系文字邮件列表里如是说：[5]

> I cannot understand why Professor Quejingzhabu insist this A before [sic: after] NNBSP as medial form. We strongly disagree this definition.
> 搞不懂确精扎布教授为什么坚持说 NNBSP 前面【误：当指「后面」】的这个 A 是中形。我们决不同意这种定义。
> If anybody insist this as medial form. I would like ask add one more medial form to all of the other characters which is possible to use before NNBSP!!!
> 谁要说这是中形的话，我就要求给其余每一个能跟在 NNBSP 后面的字符都加一个中形！！！

These mismatches should be attributed to the standard-setters' attempt to bring word boundaries to the identification of positions. For example, the six pre-MVS forms occur mostly word-medially in Hudum, so they are identified as

[5] https://lists.w3.org/Archives/Public/public-i18n-mongolian/2016JanMar/0017.html

(word-)medial forms.[6] However, this is clearly a misconstruction of the Unicode terms *isolate*, *initial*, *medial*, and *final*, which are instances of the *glyph type*. The *glyph type* concerns only joinedness of strokes at character junctures but not its adjacency to a word boundary: a form is (cursive-joiningly) initial only when it begins with a disjoined juncture and ends with a joined juncture, etc. This is the case with the Unicode specifications for Arabic script, where most letters have one final and one isolate each. Had the Mongolian practice been applied to Arabic encoding, the isolates of most Arabic letters would be identified as FVS1 finals, apart from a few (*r*, *f*, *q*, *l*) that constitute well-formed words in isolation. Thus we would have:

失配的成因是标准制定者试图将语法上的词概念引入位置的定义里来。譬如，那六个 MVS 前形基本上只出现在胡都木文单词的词中位置，就被定为（词）中形。[6]但这明显是对 Unicode 术语单形、上形、中形、下形的误读。四形都属图形类，而图形类只关心笔划在字符两端的连断：凡且只有以断笔始以连笔终的字形叫（连写）上形，以此类推。Unicode 对阿拉伯文的规定就是如此，多数字母各只有一下形一单形。倘若阿拉伯编码学蒙系文字那样，除却少数几个（*r*、*f*、*q*、*l*）单独就成词的以外，多数阿拉伯字母单形就要被认定为 FVS1 下形了，即有：

Code point 码位	Xlit. 转写	(No-FVS) final （无 FVS）下形	“FVS1 final” (mismatched isolate) 「FVS1 下形」（失配的单形）	Isolate 单形
0631	*r*	ر	(Undefined) |（未定义）	ر
0632	*z*	ز	ز	(Undefined) |（未定义）

Table | 表 3

As a result, one would have to type something like <ZWJ, __, FVS1> to get most of the letters in isolation but to type directly the letters alone for *r*, *f*, *q*, and *l*, in a standard-conformant way. It seems utterly ridiculous, but is what is going on in the Mongolian encoding. The point after all is that word boundaries should have no bearing on the cursive joining model.[7]

结果是，要合标准的话，多数字母孤显要打成像<ZWJ, __, FVS1>这样，但 *r*、*f*、*q*、*l* 的孤显得直接打字母本身。这是很荒唐，但蒙系文字编码现在就是这副局面。总之这里是要说，词界不应该影响到连写模型。[7]

With all other motivation for mismatches dismissed, one may guess that there is an established grammatical tradition of Mongolian in which the position analysis of the Hudum lettterforms shall be done primarily with regard to word boundaries. As far as we know, however, things may well be the opposite. Chinggeltei’s *蒙古语语法* (*Mongolian Grammar*, published in Chinese in 1991), a classic in this realm, groups all pre-MVS finals with ordinary finals rather than medials. An influential dictionary *蒙汉词典* (*Mongolian–Chinese Dictionary*, published in Chinese in 1999) is similar in this respect. In fact, the present author has no material at hand which goes against this practice. Moreover, the same practice is witnessed in pedagogy as well, where these mismatched cases are taught as intuitive initials or finals rather than mismatched medials, as Myatav Erdenichimeg, the author of TR170, has reported.[8] Hence it is questionable whether the position analysis of the Hudum lettterforms primarily concerning word boundaries has gained any currency.

排除了其他支持失配的理由以后，有人可能会猜——蒙古语有个金科玉律的语法传统，说胡都木文的字位分析首先要参考词界。据我们所知，情况很可能恰恰相反。一部经典著作清格尔泰《蒙古语语法》（1991 年汉文版）把所有 MVS 前下形和普通下形归在一起，而不是跟中形归。另有一本有影响力的《蒙汉词典》

[6] Note that “**词**中形” (WORD-medial) etc. are used throughout the Chinese standards instead of faithful translations like “中形” (medial), so the root of this misconstruction might be translation errors of the terms. | 注意中国标准一直用的是「**词**中形」等而非「中形」这样忠实的翻译，因此误解的根源很可能是术语翻译的失误。

[7] It may, however, be considered in line breaking, word counting or so, which is irrelevant here. | 不过在断行、计词等情况下可以考虑，但与本文无涉。

[8] https://lists.w3.org/Archives/Public/public-i18n-mongolian/2015JulSep/0198.html

（1999 年汉文版）在这方面也类似。事实上，笔者手头并没有一部资料与这种做法相悖。此外据 TR170 的作者 Myatav Erdenichimeg 传述，教学中也有同样的做法，即这些失配的例子都不悖直觉地按照上形、下形来教，而不是按失配的中形来。[8]于是，胡都木文字母位置分析首要考虑词界的做法有没有通行过还很成疑问。

To say the least, Sibe and Manchu uses FVS2 medial of U+1828 (ᠠ᠋ / ᠊ᠠ) only word-finally. It makes no sense that Sibe and Manchu should ever yield to Hudum.

退一万步讲，锡伯文满文里 U+1828 的 FVS2 的中形（ᠠ᠋ / ᠊ᠠ）只用在词末。要锡伯文满文迁就胡都木文是完全没道理的。

2.3 Hidden risk of representation clash for mismatched variants and variants *in situ*

For an encoding scheme that exhibit positional mismatches, there may be hidden risk of representation clash for mismatched variants and variants *in situ* of the same FVS assignment. Although SV.html and TR170 do not have this problem, the version of *Users' Convention for System Implementation of the International Standard on Mongolian Encoding* as cited in *蒙古文编码* (*Mongolian Encoding*, Quejingzhabu 2000) (henceforth Que2000) has. Note that Que2000 has a different specification for Hudum *g* (U+182D) from that of SV.html and TR170:

对有位置失配的编码方案来说，还可能会有隐患——FVS 指派相同的失配变体和原位变体表征出现冲突。SV.html 和 TR170 没有这个问题，但《蒙古文编码》（确精扎布 2000）中所引用的《蒙古文编码国际标准系统实现用户协定》的版本（以下简称 Que2000）就有。注意 Que2000 对胡都木文 *g*（U+182D）的规定与 SV.html 和 TR170 都不一样：

	No-FVS | 无 FVS	FVS1	**FVS2**	FVS3
Medial (Unicode & Que2000) | 中形（Unicode、Que2000）	ᠠ ᠊ᠠ	ᠡ ᠊ᠡ	ᠢ᠋ ᠊ᠢ	ᠣ ᠤ
Final (Que2000) | 下形（Que2000）		᠊ᠡ	᠋ᠭ ᠊ᠭ	
Final (Unicode) | 下形（Unicode）	᠊ᠠ	᠋ᠭ ᠊ᠭ		

Table | 表 4

And then we are in trouble when representing the two FVS2 forms in context according to Que2000:

然后按照 Que2000，我们要在语境中表征这两个 FVS2 形就麻烦了：

Slot | 地位	Glyph | 图形	Out-of-context representation | 孤显表征	In-context representation | 语境表征	
			Before MVS | MVS 前	Word-finally | 词末
FVS2 medial | FVS2 中形	ᠢ᠋ ᠊ᠢ	ZWJ, __, FVS2, ZWJ	…, __, MVS	**…, __, FVS2]**
FVS2 final (Que2000) | FVS2 下形（Que2000）	᠋ᠭ ᠊ᠭ	ZWJ, __, FVS2	…, __, FVS2, MVS	
FVS1 final (Unicode) | FVS1 下形（Unicode）	᠋ᠭ ᠊ᠭ	ZWJ, __, FVS1	…, __, FVS1, MVS	…, __, FVS1]

Table | 表 5

Representations for word-final FVS2 medial and word-final FVS2 final clash, because all ZWJes are removed in context.

词末 FVS2 中形和词末 FVS2 下形的表征撞了，因为语境中所有 ZWJ 都要去掉。

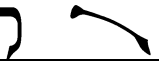
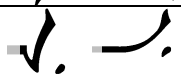
3 A full list of mismatches | 失配全表

We have reached the conclusion in the previous section that the identification of positions should not take into consideration anything other than graphic joinedness. In a thorough investigation into SV.html with this principle, we find 30 cases of mismatch in total. These mismatches fall into 5 classes according to their causes of mismatch:

- Type A: disjointed tails. Disjointed tails, as variants of *a* (U+1820) and *e* (U+1821), occurs only word-finally after MVS. They are isolates instead of finals as they are disjoined at both junctures.
- Type B: pre-MVS consonants forms. Most pre-MVS consonant forms are joined at the beginning juncture and disjoined at the ending juncture, and are thus finals. The only exception is ᠺ / ᠬ as in Hudum *bui-ǰ_a* ᠪᠤᠢ ᠵᠠ / ᠪᠤᠢ ᠬᠠ (particle), which is disjoined at both junctures, and is thus an isolate of *ǰ* (U+1835).
- Type C: post-NNBSP vowel forms. Post-NNBSP vowel forms are disjoined at the beginning juncture, and are thus initials and isolates rather than medials or finals.
- Type D: consonant isolates. Consonants except above-mentioned *ǰ* (U+1835) have no genuine isolates. The so-called consonant isolates in the current standard are in fact initials and medials.
- Type E: straight tails in Todo. Two Todo letters, *e* (U+1844) and *d* (U+1851), end in the straight tail. In the current standard, *e*'s isolate (ᡝ / ᢝ) is subsumed by no-FVS initial (ᡝ / ᢝ), *e*'s final (ᡑ / ᡑ) by no-FVS medial (ᡑ / ᡑ), and *d*'s medial (ᡓ / ᡔ) by no-FVS final (ᡓ / ᡔ), simply because the difference between a straight tail and a broken joined juncture is minimal in some fonts.

前一节已经得出结论，位置的认定不应该考虑字形连断以外的任何因素。以此原则排查 SV.html，总共发现了 30 例失配，依其成因分为以下五类：

- A 类：分尾。分尾是 *a*（U+1820）、*e*（U+1821）的变体，只出现在 MVS 后的词末。因为两端都不连，所以是单形不是下形。
- B 类：MVS 前辅音形。大多数 MVS 前辅音都是连笔入断笔出，所以是下形。唯一的例外是胡都木文的 *bui-ǰ_a* ᠪᠤᠢ ᠵᠠ / ᠪᠤᠢ ᠬᠠ（助词）中的ᠺ / ᠬ，两端都不连，因而是 *ǰ*（U+1835）的单形。
- C 类：NNBSP 后元音形。NNBSP 后元音形开头是断笔，因而是单形或上形，而非中形或下形。
- D 类：辅音单形。除了上文提及的 *ǰ*（U+1835）以外都没有真单形；现行标准中所谓的辅音单形其实是上形和中形。
- E 类：托忒文直尾。两个托忒字母 *e*（U+1844）和 *d*（U+1851）结尾是直尾。现行标准中，*e* 的单形（ᡝ / ᢝ）被归给无 FVS 上形（ᡝ / ᢝ），*e* 下形（ᡑ / ᡑ）被归给无 FVS 中形（ᡑ / ᡑ），*d* 中形（ᡓ / ᡔ）被归给无 FVS 下形（ᡓ / ᡔ），只因为直尾和断开的连笔在某些字体中区别很细微。

Type 类	No. 号	Code point 码位	Char. name 字符名	Slot 地位	Glyph 图形	Used in* 用于*	Should be 应作	Subsumed glyph 涵盖的图形	Used in* 用于*	Should be 应作
A	1	1820	ML. A	FVS1 final | FVS1 下形		AA__			H___	Isolate | 单形
	2	1821	ML. E	FVS1 final | FVS1 下形		H___			H___	Isolate | 单形
B	3	1828	ML. NA	FVS2 medial | FVS2 中形		H_SM	Final | 下形			
	4	182C	ML. QA	FVS2 medial | FVS2 中形		H___	Final | 下形			
	5[a]	182C	ML. QA	FVS3 medial | FVS3 中形		H___	Final | 下形			
	6	182D	ML. GA	FVS2 medial | FVS2 中形		H___	Final | 下形			

	7	1835	ML. JA	FVS1 medial | FVS1 中形			H___	Final | 下形			H___	Isolate | 单形
	8[a]	1836	ML. YA	FVS2 medial | FVS2 中形			H___	Final | 下形				
	9	1820	ML. A	FVS2 medial | FVS2 中形			H___	Initial | 上形				
	10	1822	ML. I	No-FVS final | 无 FVS 下形			H___				H___	Isolate | 单形
	11	1822	ML. I	No-FVS medial | 无 FVS 中形			H___				H___	Initial | 上形
	12	1824	ML. U	No-FVS final | 无 FVS 下形			H___				H___	Isolate | 单形
	13	1824	ML. U	No-FVS medial | 无 FVS 中形			H___				H___	Initial | 上形
C	14	1826	ML. UE	No-FVS final | 无 FVS 下形			H___				H___	Isolate | 单形
	15	1826	ML. UE	No-FVS medial | 无 FVS 中形			H___				H___	Initial | 上形
	16	1828	ML. NA	FVS3 medial | FVS3 中形			_T__	Initial | 上形				
	17	185E	MLS. I	No-FVS final | 无 FVS 下形			__S_				__S_	Isolate | 单形
	18	1873	MLM. I	No-FVS final | 无 FVS 下形			___M				___M	Isolate | 单形
	19[bc]	182C	ML. QA	No-FVS isolate | 无 FVS 单形			H___	Initial | 上形			H___	Medial | 中形
	20[d]	182C	ML. QA	FVS1 isolate | FVS1 单形			H___	Initial | 上形			H___	Medial | 中形
	21[be]	182D	ML. GA	No-FVS isolate | 无 FVS 单形			H___	Initial | 上形				
	22[b]	184E	MLT. GA	No-FVS isolate | 无 FVS 单形			_T__	Initial | 上形			_T__	Medial | 中形
D	23[b]	1863	MLS. KA	No-FVS isolate | 无 FVS 单形			__S_	Initial | 上形			__S_	Medial | 中形
	24[b]	1864	MLS. GA	No-FVS isolate | 无 FVS 单形			__SM	Initial | 上形			__SM	Medial | 中形
	25[b]	1865	MLS. HA	No-FVS isolate | 无 FVS 单形			__SM	Initial | 上形			__SM	Medial | 中形
	26[b]	1874	MLM. KA	No-FVS isolate | 无 FVS 单形			___M	Initial | 上形				
	27[b]	1889	MLAG. KA	No-FVS isolate | 无 FVS 单形			AA__	Medial | 中形				
E	28	1844	MLT. E	No-FVS initial | 无 FVS 上形			_T__				_T__	Isolate | 单形

	29[fg]	1844	MLT. E	No-FVS medial | 无 FVS 中形			–T—				–T—	Final | 下形
	30[h]	1851	MLT. DA	No-FVS final | 无 FVS 下形			–T—				–T—	Medial | 中形

[*] The four slots HTSM indicate usages in daily Hudum, Todo, Sibe, and Manchu respectively; A's indicate Galic-only usages.
[a] Duplicated as no-FVS final in Unicode 10 code chart by editorial error.
[b] Omitted in Unicode 10 code chart by editorial error.
[c] Moved to FVS1 isolate in the Chinese standards (GB/T 26226—2010 and GB/T 25914—2010).
[d] Moved to FVS2 isolate in the Chinese standards (GB/T 26226—2010 and GB/T 25914—2010).
[e] Moved to no-FVS initial in the Chinese standards (GB/T 26226—2010 and GB/T 25914—2010).
[f] No-FVS final added in the Chinese standard (GB/T 26226—2010).
[g] No-FVS final added in Unicode 10 code chart by editorial error.
[h] No-FVS medial added in Unicode 10 code chart by editorial error.

[*] HTSM 四项分别指胡都木文、托忒文、锡伯文、满文；A 指唯阿礼嘎礼用法。
[a] Unicode 10 码表因编辑错误重出为无 FVS 下形。
[b] Unicode 10 码表因编辑错误而脱漏。
[c] 中国标准（GB/T 26226—2010、GB/T 25914—2010）改为 FVS1 单形。
[d] 中国标准（GB/T 26226—2010、GB/T 25914—2010）改为 FVS2 单形。
[e] 中国标准（GB/T 26226—2010、GB/T 25914—2010）改为无 FVS 上形。
[f] 中国标准（GB/T 26226—2010）补作无 FVS 下形。
[g] Unicode 10 码表因编辑错误增为无 FVS 下形。
[h] Unicode 10 码表因编辑错误增为无 FVS 中形。

Table | 表 6

4 Representative glyphs and letter citations | 代表形和字母引称用法

It is noted that there are proposals that wishes to introduce more mismatches to the standard, notably Greg Eck's *DS01* (as of 2016-12-16). These mismatches are intended for showing representative glyphs (as in Unicode code charts) and citations for consonant letters (as in grammar books and dictionaries) as isolates. In the former case, MONGOLIAN LETTER UE (U+1826) for example, the representative glyph originally as no-FVS initial ( / ) is proposed to be duplicated as FVS2 isolate, in addition to no-FVS isolate ( / ) and FVS1 isolate ( / ). In the latter case, MONGOLIAN LETTER TODO ANG (U+184A) for example, no-FVS medial ( / ) is proposed to be duplicated as no-FVS isolate, the only motivation being that the medial is generally used as a stand-in in letter citation in absence of a genuine isolate for U+184A. These proposals go blatantly against the Arabic cursive joining model and should be dismissed immediately. ZWJ (and FVSes) shall be used instead to get the desired forms *in situ* in these cases.

注意到有提案要给 Unicode 新增失配，特别是 Greg Eck 的 DS01（2016-12-16 版）。这些失配是用单形来展示代表形（如见于 Unicode 码表）和辅音字母的引称用法（如见于语法书和字典）。前一种，如 MONGOLIAN LETTER UE（U+1826）的代表形（ / ）原本是无 FVS 上形，在提案中以 FVS2 单形重出，位列无 FVS 单形（ / ）、FVS1 单形（ / ）之次。后一种，如 MONGOLIAN LETTER TODO ANG（U+184A），无 FVS 中形（ / ）在提案中以无 FVS 单形重出，理由仅仅是字母 U+184A 在引称时因为没有真单形而一般会用中形顶替。这些提案与阿拉伯连写模型背道而驰，第一眼就该否决掉。这些情况下应该改用 ZWJ（和 FVS）在原位得到想要的字形。

5 Summary | 总结

The positional mismatches in current Mongolian encoding:

- are illogical from a technical perspective;
- contradict users' intuition; and
- are not underpinned by a grammar tradition.

现行蒙系文字编码中的位置失配：

- 技术上不合逻辑；
- 与用户直觉相悖；
- 没有语法传统支持。

To clear up the mess, I request that these mismatches as listed in Section 3 be rectified at a later point when we have reached a consensus on the potential reassignments of variants, and that no more mismatches should be introduced in the future.

为收拾乱局，我提请在未来时机适当时——即可能对变体的重新指派有了共识的时候——改正第 3 节所列的失配，并且今后不应增添新的失配。

An excerpt of the resultant chart of Mongolian variants is shown below: (affected cells highlighted; colors indicating mismatch types; deleted cells rendered in dark grey)

改正失配后的蒙系文字变体表节录如下：（所涉的格子高亮；彩色表示失配类型；删去的格子染成深灰）

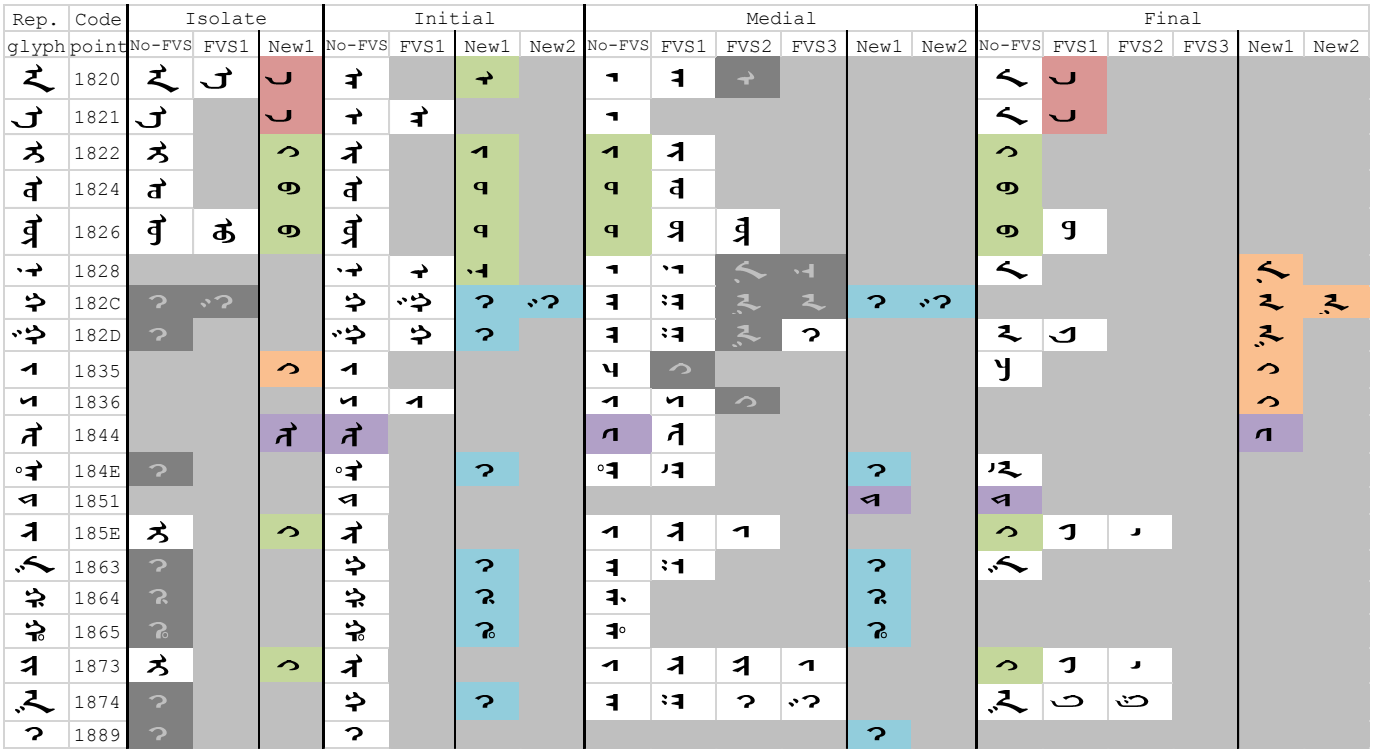


Table | 表 7

A Full chart of the Mongolian variant specifications in TUS without editorial errors | 剔除了编辑错误的 Unicode 标准蒙系文字变体指定全表

A full chart of the Mongolian variant specifications in TUS without editorial errors (yet containing positional mismatches), based on SV.html completed with TR170 according to my arranging of the data, is given below for reference: (mismatches highlighted; references of representative glyphs in red)

下面给出的是我根据资料得到的剔除了编辑错误的 Unicode 标准蒙系文字变体指定全表（但保留了位置失配），以 SV.html 为基础依 TR170 补全：（失配的格子高亮；代表形所引的形用红字）

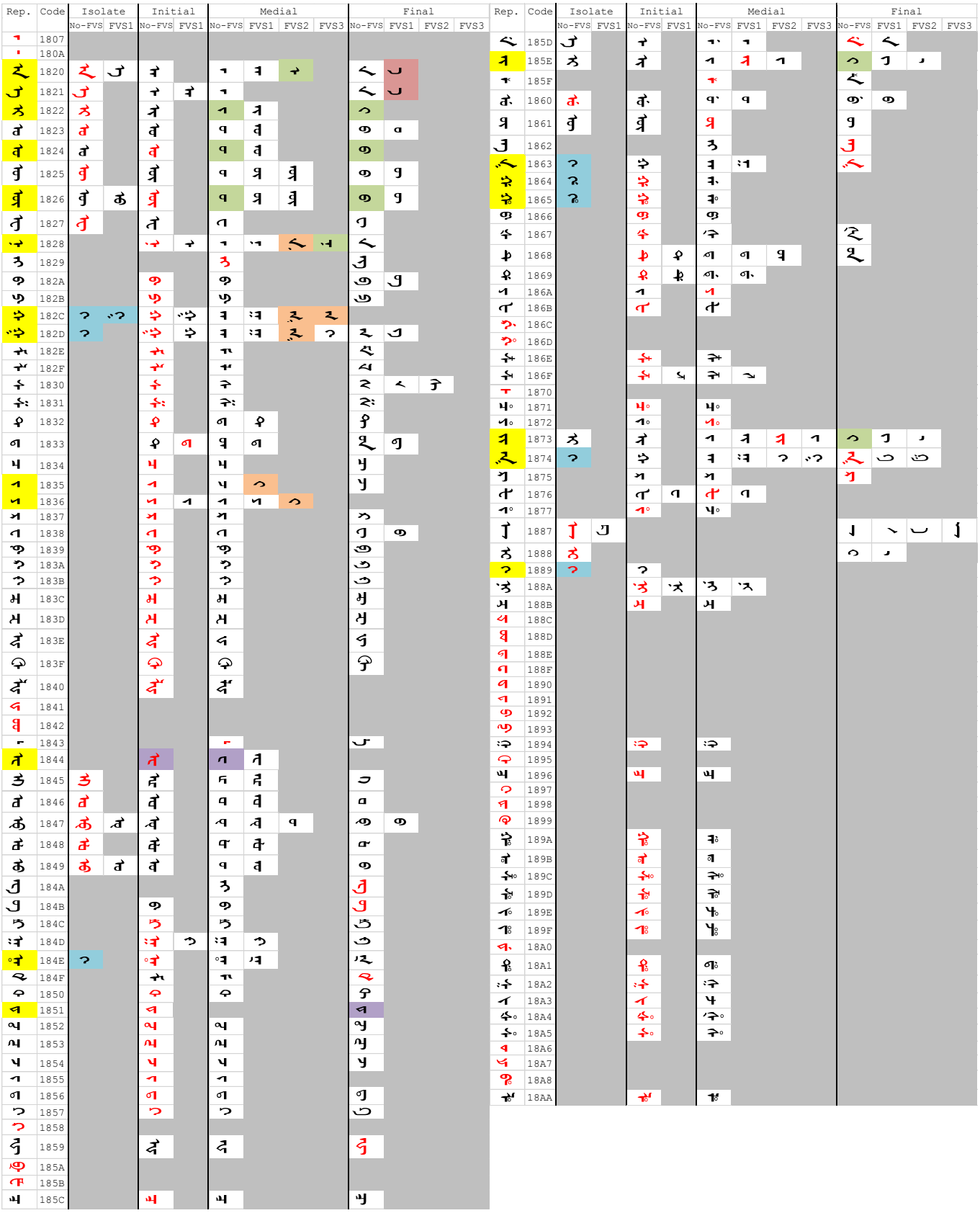


Table | 表 8

B List of editorial errors in Unicode 10 Mongolian code chart | Unicode 10 蒙系文字码表中的编辑错误

A full list of the editorial errors in Unicode 10 Mongolian code chart is given at the end of the document, also duplicated in the.xlsx file embedded in this document.

Unicode 10 蒙系文字码表中的编辑错误全表见文件末，又见于本文件内嵌的.xlsx 文件。

This table addresses only editorial errors in Unicode 10 Mongolian code chart, which are defined as differences with TR170 (except for very few later intended modifications of TUS).

本表只涉及 Unicode 10 蒙系文字码表中的编辑错误，其中编辑错误定义为与 TR170 的差异（刨开个别后来 Unicode 有意的修改）。

It should be noted that this table excludes even apparent substantive errors that exist in TR170, and includes also editorial errors that coincide with the desired future spec, in which cases comments are given as far as possible.

应当注意本表不包括 TR170 中存在的实质性错误，而包括了编辑错误与未来标准中想要的修改偶合的部分，并尽可能加了注。

In addition, Type 4 items are by no means editorial errors since these forms are systematically omitted, but simply included here for the convenience of checking.

此外，因为第 4 类的形是系统地省略的，所以并不能算作编辑错误；不过还是附在了本表中以便查对。

code point 码位	char. name 字符名	type 类	description 描述	error history 错误历史	comment 注
186F	MLS. ZA	1	deformed glyph for FVS1 medial FVS1 中形图形不当	since U7.0 (code chart) U7.0（码表）已然	see SV.html for the correct glyph (should have no lower stem, otherwise not joinable to the following U+185e Sibe I) 正确的图形见 SV.html（收笔不应有字脊，否则没法接写其后的 U+185e Sibe I）
186F	MLS. ZA	1	deformed glyph for FVS1 initial FVS1 上形图形不当	since U3.2 (SV.html) U3.2（SV.html）已然	should have no lower stem, otherwise not joinable to the following U+185e Sibe I 收笔不应有字脊，否则没法接写其后的 U+185e Sibe I
1874	MLM. KA	1	deformed glyph for no-FVS final and the representative glyph 无 FVS 下形与代表形图形不当	since U7.0 (code chart) U7.0（码表）已然	see SV.html for the correct glyph (should have a larger tail, distinct from U+182D's FVS2 medial) 正确的图形见 SV.html（尾笔应当更大，异于 U+182D 的 FVS2 中形）
1807	MS. SYLLABLE BOUNDARY MARKER	2	unsanctioned positional variant 位置变体未获批准	new error 新错误	
180A	M. NIRUGU	2	unsanctioned positional variant 位置变体未获批准	new error 新错误	not available to Joining_Causing characters Joining_Causing 字符不该有位置变体
1829	ML. ANG	2	unsanctioned initial 上形未获批准	new error 新错误	evidently ungrounded 明显没有依据
182C	ML. QA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	grounded yet unsanctioned owing to mismatch 有依据但因失配未获批准
1836	ML. YA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	grounded yet unsanctioned owing to mismatch 有依据但因失配未获批准
1840	ML. LHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1841	ML. ZHI	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1842	ML. CHI	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1843	MLT. LONG VOWEL SIGN	2	unsanctioned initial 上形未获批准	new error 新错误	evidently ungrounded 明显没有依据

1844	MLT. E	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	grounded yet unsanctioned owing to mismatch 有依据但因失配未获批准
184A	MLT. ANG	2	unsanctioned initial 上形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1851	MLT. DA	2	unsanctioned medial 中形未获批准	new error 新错误	grounded yet unsanctioned owing to mismatch 有依据但因失配未获批准
1855	MLT. YA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1858	MLT. GAA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
185A	MLT. JIA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
185B	MLT. NIA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
185F	MLS. IY	2	unsanctioned initial 上形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1862	MLS. ANG	2	unsanctioned initial 上形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1864	MLS. GA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1865	MLS. HA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1866	MLS. PA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1869	MLS. DA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	evidently ungrounded 明显没有依据
186A	MLS. JA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
186B	MLS. FA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
186C	MLS. GAA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
186D	MLS. HAA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	

186E	MLS. TSA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
186F	MLS. ZA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	possibly grounded yet unsanctioned 可能有依据但未获批准
1870	MLS. RAA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1871	MLS. CHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1872	MLS. ZHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1876	MLM. FA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	evidently ungrounded 明显没有依据
1877	MLM. ZHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1887	MLAG. A	2	unsanctioned initial and medial 上形和中形未获批准	since U9.0 (code chart) U9.0（码表）已然	evidently ungrounded 明显没有依据
1888	MLAG. I	2	unsanctioned initial and medial 上形和中形未获批准	since U9.0 (code chart) U9.0（码表）已然	possibly grounded yet unsanctioned 可能有依据但未获批准
1889	MLAG. KA	2	unsanctioned medial and final 中形和下形未获批准	new error 新错误	final evidently ungrounded; medial grounded yet unsanctioned owing to mismatch 下形明显没有依据；中形有依据但因失配未获批准
188A	MLAG. NGA	2	unsanctioned final 下形未获批准	since U9.0 (code chart) U9.0（码表）已然	evidently ungrounded 明显没有依据
188B	MLAG. CA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
188C	MLAG. TTA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
188D	MLAG. TTHA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
188E	MLAG. DDA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
188F	MLAG. NNA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	

1890	MLAG. TA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1891	MLAG. DA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1892	MLAG. PA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1893	MLAG. PHA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1894	MLAG. SSA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1895	MLAG. ZHA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1896	MLAG. ZA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
1897	MLAG. AH	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1898	MLTAG. TA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
1899	MLTAG. ZHA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
189A	MLMAG. GHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
189B	MLMAG. NGA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
189C	MLMAG. CA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
189D	MLMAG. JHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
189E	MLMAG. TTA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
189F	MLMAG. DDHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A0	MLMAG. TA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	

18A1	MLMAG. DHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A2	MLMAG. SSA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A3	MLMAG. CYA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A4	MLMAG. ZHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A5	MLMAG. ZA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
18A6	MLAG. HALF U	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
18A7	MLAG. HALF YA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
18A8	MLMAG. BHA	2	unsanctioned positional variants 位置变体未获批准	new error 新错误	
18AA	MLMAG. LHA	2	unsanctioned final 下形未获批准	new error 新错误	evidently ungrounded 明显没有依据
182C	ML. QA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
182D	ML. GA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
184E	MLT. GA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
1863	MLS. KA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
1864	MLS. GA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删

1865	MLS. HA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
1874	MLM. KA	3	omitted no-FVS isolate (distinct from the representative glyph) 脱漏无 FVS 单形（异于代表形）	since U9.0 (code chart) U9.0（码表）已然	subject to future deletion owing to mismatch 属失配，未来当删
1820	ML. A	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1821	ML. E	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1822	ML. I	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1823	ML. O	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1825	ML. OE	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1827	ML. EE	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1845	MLT. I	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1846	MLT. O	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1847	MLT. U	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	

1848	MLT. OE	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1849	MLT. UE	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1860	MLS. UE	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1880	MLAG. ANUSVARA ONE	4	implicit no-FVS form (identical with the representative glyph) 无 FVS 形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1881	MLAG. VISARGA ONE	4	implicit no-FVS form (identical with the representative glyph) 无 FVS 形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1887	MLAG. A	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1888	MLAG. I	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	
1889	MLAG. KA	4	implicit no-FVS isolate (identical with the representative glyph) 无 FVS 单形未明示（同代表形）	since U3.2 (SV.html) U3.2（SV.html）已然	subject to future deletion owing to mismatch 属失配，未来当删

Table | 表 9