Revised Proposal to Encode the Mongolian Square Script in ISO/IEC 10646

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1 Introduction

This is a proposal to encode the Mongolian Square script in the Universal Character Set (ISO/IEC 10646). It supersedes the following documents:

- N3956 L2/10-411 "Preliminary Proposal to Encode the Xawtaa Dorboljin Script in ISO/IEC 10646"
- N4041 L2/11-162 "Preliminary Proposal to Encode the Mongolian Square Script in ISO/IEC 10646"
- N4160 L2/11-379 "Revised Preliminary Proposal to Encode the Mongolian Square Script"
- N4413 L2/13-068 "Proposal to Encode the Mongolian Square Script in ISO/IEC 10646"

Major changes introduced after the previous proposal include: A revised model for encoding consonant conjuncts that employs a control character for indicating the subjoining behavior of letters in conjuncts. A set of characters that represent contextual forms of letters has been proposed in order to accommodate the encoding model. A set of reversed letters and a vowel sign have also been added. A description of the orthography for various languages has been added. Minor changes include new names for some characters, alteration to the order of characters, and the reallocation of the script block to a new range within the SMP.

The Mongolian Square font used here is based upon the font developed by Oliver Corff in November 2001 for his "Xäwtää Dörböljin for LATEX 2$_\varepsilon$" package. The proposal author has made modifications to Corff's original font, which consist of the addition of new characters and glyphs.

2 Background

The Mongolian Square Script (Mongolian: Хэвтээ Дөрвөлжин бичиг *xewtee dörböljin bicig*) is an alpha-syllabary based upon the Brahmi model and inspired directly by Tibetan. It is also known as the 'Mongolian Horizontal Square Script'. The script was used for writing Mongolian, Sanskrit, and Tibetan. Mongolian Square was developed by Zanabazar, the first spiritual leader of Tibetan Buddhism in Mongolia, who also

developed the Soyombo script. Mongolian Square was inspired by the Tibetan script and has graphical similarities to the Phags-pa seal and book scripts (see tables 1–3). Mongolian Square is actively studied by scholars, ie. Bareja-Starzyńska and Ragchaa (2012).

3 Proposal Details

3.1 Script and Character Names

The proposed name for the script is 'Mongolian Square'. The Mongolian name 'Xewtee Dörböljin' and its English rendering 'Horizontal Square' have been added as alternate names in an annotation to the names list. Names for characters are based upon Latin transliterations given in secondary sources, such as Shagdarsürüng (2001), with descriptors added for distinguishing characters with identical transliterated names. An attempt has been made to align names with those for Tibetan characters in the UCS, and in parallel to those proposed for Soyombo (see N4414 L2/13-069).

3.2 Proposed Repertoire

The script block contains 67 characters. A code chart and names list are attached. The encoding order for Mongolian Square attempts to follow the general arrangement of the script as shown in traditional charts. However, differences between the proposed order and that of script charts are inherently necessary as the encoded repertoire contains elements that are not enumerated in traditional charts.

4 Script Details

4.1 Structure

The Mongolian Square script is written from left to right. As indicated by its Mongolian name, *xewtee dörböljin bicig*, the script is written horizontally and is not used in vertical environments. Independent vowels are written using a vowel-carrier letter to which vowel signs are attached. Vowel length is indicated by a sign that is attached to a base letter or to a combination of a base letter and a dependent vowel sign. Consonant letters possess the inherent vowel *a*. The phonetic value of a consonant letter is changed by attaching a vowel sign to it. Consonant clusters are rendered as stacks, with non-initial letters written beneath the initial letter. A model based upon the use of a joiner is proposed for encoding such stacks, and initial and final forms of some consonants are proposed in order to facilitate this approach.

4.2 Vowel Letter

The ᒐᒻ Letter A is a vowel carrier. When it occurs independently it represents either the vowel *a* or a zero vowel, depending upon the linguistic environment. When a vowel sign is attached to Letter A, the combination represents an independent or initial vowel, and the Letter A assumes the phonetic value of the combining vowel sign.

4.3 Vowel Length Mark

The ◌ Vowel Length Mark indicates vowel length. When attached to a letter it represents the lengthening of the inherent vowel *a* to *ā*, eg ᒐᒻ *ā* and ᒄ *kā*. When it is written in combination with a vowel sign, the

mark always occurs after the latter, eg. ⎀ *ī* is produced with the sequence <⎀ LETTER A, ◌̑ VOWEL SIGN I, ◌̗ VOWEL LENGTH MARK>. It can only occur after a base letter or a vowel sign.

4.4 Vowel Signs

There are 9 dependent vowel signs:

◌̑	VOWEL SIGN I	◌̤	VOWEL SIGN U	◌̓	VOWEL SIGN AI
◌̄	VOWEL SIGN E	◌̌	VOWEL SIGN O	◌̖	VOWEL SIGN AU
◌̯	VOWEL SIGN UE	◌̄	VOWEL SIGN OE	◌̑	REVERSED VOWEL SIGN I

Initial and independent forms of vowels are represented by attaching vowel signs to ⎀ LETTER A (see section 4.4.1 for details on the usage of ◌̑ REVERSED VOWEL SIGN I). Long vowels are represented by combining the vowel signs with the ◌̗ VOWEL LENGTH MARK. The first 8 vowel signs and the VOWEL LENGTH MARK can be used for writing the basic 16 vowel sounds provided for by the script:

⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀ ⎀
a ā i ī e ē ü ū u ū o ō ö ȫ ai au

The ◌̑ VOWEL SIGN I is often written as a full arch ◌̑, eg. independent *i* and *ī* are written as ⎀ and ⎀, as well as ⎀ and ⎀ (see figure 1).

The ◌̄ VOWEL SIGN OE has the alternate form ◌̄, eg. ⎀ *ö* and ⎀ *ȫ*. It is a mirrored form of ◌̄ VOWEL SIGN E. This form is a glyphic variant and its usage is to be handled through fonts.

4.4.1 Reversed vowel sign

The ◌̑ REVERSED VOWEL SIGN I is used for representing the Sanskrit vocalic sounds ⎀ *ṛ*, ⎀ *ṝ*, ⎀ *ḷ*, ⎀ *ḹ* (see figure 9). These letters are represented in encoded text using ⎀ RA and ⎀ LA in conjunction with ◌̑ REVERSED VOWEL SIGN I. Long forms are produced by placing ◌̗ VOWEL LENGTH MARK after the base sequences. When the vocalic sounds occur in a consonant-vowel combination, ⎀ RA and ⎀ LA are written using the contextual subjoined final forms ◌̦ LETTER FINAL RA and ◌̦ LETTER FINAL LA (see section 4.8.1), eg. ⎀ *kṛ* is represented in encoded text as <⎀ GA, ◌̦ LETTER FINAL RA, ◌̑ REVERSED VOWEL SIGN I> and ⎀ *kḷ* is represented in encoded text as <⎀ GA, ◌̦ LETTER FINAL LA, ◌̑ REVERSED VOWEL SIGN I>.

Sources, such as Kara (1972), write the vocalic letters using the full arched form ◌̑ instead of the half arch ◌̑ of VOWEL SIGN I: ⎀ *ṛ*, ⎀ *ṝ*, ⎀ *ḷ*, ⎀ *ḹ*. These forms are attested variants, but they do not allow for distinctive representations of syllables, eg. ⎀ could be read as either *kṛ* or *kri*. Using distinctive forms for VOWEL SIGN I and REVERSED VOWEL SIGN I, the syllable *kṛ* is written as ⎀ and *kri* as ⎀. The orthography for Sanskrit vocalic sounds is parallel to that in Tibetan, in which the vowel sign *i* ◌̑ is reversed as ◌̑ when writing ⎀ *ṛ*.

4.4.2 Other vowel forms

Some vowels have alternate representations: the form ⎀ <LETTER A, VOWEL SIGN AI, VOWEL LENGTH MARK> is used in some records in place of ⎀ <LETTER A, VOWEL SIGN AU> for representing the diphthong *au*. The proposal treats these as distinct text elements with separate encoded representations.

4.5   Consonant Letters

There are 42 consonant letters:

ᠵᠵ	GA	᠊ᠾᠾ	MA	᠆	GALIG DDA	᠎	GALIG DA
ᠾ	KA	ᠾ	YA	᠆	GALIG DDHA	᠎	GALIG DHA
ᠵ	NGA	ᠾ	RA	᠆	GALIG NNA	᠎	GALIG BHA
ᠵ	JA	ᠾ	LA	᠆	GALIG ZHA	᠎	GALIG TSA
ᠾ	CA	ᠾ	VA	᠆	GALIG ZA	᠎	GALIG TSHA
ᠵ	NYA	ᠾ	SHA	᠆	GALIG SMALL A	᠎	GALIG DZA
ᠾ	DA	ᠾ	SA	᠆	GALIG GA	᠎	REVERSED DA
ᠾ	TA	ᠾ	HA	᠆	GALIG GHA	᠎	REVERSED NA
ᠾ	NA	ᠾ	GALIG KSSA	᠆	GALIG JA	᠎	REVERSED SHA
ᠾ	BA	ᠾ	GALIG TTA	᠆	GALIG JHA		
ᠾ	PA	ᠾ	GALIG TTHA	᠆	GALIG VA		

The order of the consonant letters adheres to that given in traditional charts. The letters ᠵᠵ GA .. ᠾ HA are used in common for writing Mongolian, Sanskrit, and Tibetan. The letters with names containing the descriptor 'GALIG' (from гали *galig*, a Mongolian term for the transcription of non-Mongolian sounds) are used for writing Sanskrit and Tibetan. The term distinguishes letters used for writing the same sound, but in different languages, eg. ᠵᠵ and ᠾ both represent /g/, but the latter is reserved for Sanskrit and Tibetan.

4.5.1   Notes on consonants

▢ **VA**   Traditional charts of the script show two instances of the letter ▢ with various phonetic values. In figure 1, the first instance occurs after ᠾ LA and is given the values /v/ and /b/; the second precedes ᠎ GALIG BHA and has the value /b/. The first ▢ occurs among the common letters, while the second ▢ occurs among the *galig* letters. It is clear that the charts attempt to show usage of the letter in both common and *galig* environments. Shagdarsürüng indicates that the first ▢ is used for writing /v/ in Mongolian, Tibetan, and Sanskrit (see figure 7), while the second ▢ ('*galig ba*') is used for writing /b/ and /p/ in Sanskrit (see figure 9); ᠎ GALIG VA is used for writing Sanskrit and Tibetan /v/. Given the identical glyphic representation of both instances of ▢, only one is proposed for encoding, and that as the common letter VA. The name VA is chosen over the corresponding Tibetan WA.

᠎ **GALIG KSSA**   The letter ᠎ GALIG KSSA represents the Sanskrit cluster *kṣa* (/kṣa/). In Mongolian Square, this letter represents a phoneme that is phonetically a consonant cluster, but, it has the structure of an atomic letter. It is encoded as a consonant letter because in all cases consonant conjunct forms are written as stacks in Mongolian Square, not as ligatures. While in some scripts the written form for Sanskrit /kṣa/ has an encoded representation as a character sequence, such an approach would not be consistent with this script.

᠎ **GALIG SMALL A**   The letter ᠎ GALIG SMALL A corresponds to ཨ U+0F60 TIBETAN LETTER -A.

᠎ **GALIG VA**   The is some confusion in the secondary sources regarding the value of the glyph ᠎. Kapaj believes it represents /v/, but is uncertain and so glosses the glyph as '(v?)' (figure 2). Kara shows the glyphic variant ᠎ for ᠎ and expresses a similar uncertainty as he also annotates the glyph as '(v?)' (figure 1). On the other hand, Shagdarsürüng departs from the idea that ᠎ represents a semi-vowel and offers with

uncertainty that it may be used for /s/, writing 'sa (?)' (figure 8). An analysis of Soyombo offers clarification. The Soyombo ◌ is used for /v/ and is fairly similar to the Mongolian Square glyphic variant ◌ for ◌.

4.5.2   Reversed consonants

There are 3 reversed consonant letters in Mongolian Square: ㅋ REVERSED DA, ㅌ REVERSED NA, ㄸ REVERSED SHA. These letters are reversed forms of the regular letters and are used for writing Sanskrit retroflex sounds. The practice is borrowed from Tibetan, in which the Sanskrit retroflex sounds are written by reversing letters for dental consonants: ད *ta*, ཐ *tha*, ད *da*, དྷ *dha*, ན *na* are reversed for ཊ *ṭa*, ཋ *ṭha*, ཌ *ḍa*, ཌྷ *ḍha*, ཎ *ṇa*. sounds. In other cases, a sound is represented using a reversed form of a letter for a related sound, eg. ཤ *śa* is reversed as ཥ for the retroflex sound *ṣa*. The reversed letters proposed for encoding are described below:

ㅋ **REVERSED DA**   Figure 17 shows a subjoined ㅋ, the reversed form of ㅌ DA (/d/, /t/) used instead of ㅌ GALIG TTA in cluster-final position for writing Sanskrit /ṭ/.

ㅌ **REVERSED NA**   A manuscript of a biography of Zanabazar contains the character ㅌ in the word ᠊ᠮ᠊ *maṇi* (see figure 19). This character is a reversed form of ㅁ NA (/n/) and is used for representing Sanskrit /ɳ/.

ㄸ **REVERSED SHA**   The REVERSED SHA is a reversed form of ㄸ SHA and it represents the Sanskrit *ṣa* (retroflex sibilant /ʂ/). It does not appear in traditional charts, but occurs in manuscripts, eg. in the word ᠊ᠮᠠᠩᠵᠤ᠊ *mañjughoṣāya* "to Mañjughoṣa" in the invocation at the top of the chart in figure 2. The letter also occurs in the manuscript fragment shown in detail in figure 17.

The use of ㅋ REVERSED DA for /ṭ/ and ㅌ REVERSED NA for /ɳ/ are curious because the script has the distinctive letters ㅌ GALIG TTA for /ṭ/ and ◁ GALIG NNA for /ɳ/. It is also curious that Zanabazar, the creator of the script, did not provide a distinctive letter *GALIG SSA for writing /ʂ/ in Mongolian Square as he did in Soyombo.

4.5.3   Glyphic variants

There are glyphic variants for some consonant letters: ᠊ = ᠊ GALIG GHA; ᠊ = ᠊ GALIG DHA; ◌ = ◌ GALIG VA. These are to be managed through fonts.

4.5.4   Representation of Sanskrit and Tibetan

Mongolian is written using the common letters:

ga	ㄣ	GA	*ta*	日	TA	*la*	ㄇ	LA
ka	ㄇ	KA	*na*	ㅁ	NA	*va*	□	VA
ṅa	ㄹ	NGA	*ba*	凵	BA	*ša*	ㄸ	SHA
ǰa	ㅂ	JA	*pa*	ㄸ	PA	*sa*	N	SA
ča	ㄸ	CA	*ma*	ㅃ	MA	*ha*	ㄸ	HA
ña	ㅋ	NYA	*ya*	ㅆ	YA			
da	ㅌ	DA	*ra*	ㅈ	RA			

Sanskrit and Tibetan are represented using a mix of common and *galig* letters. The common letters for voiced sounds (eg. ㄣ GA, ㅂ JA, ㅌ DA, 凵 BA) are used for Sanskrit voiceless unaspirated stops, while the letters for

voiceless sounds (eg. Ⅲ KA, Ⅲ CA, 日 TA, Ⅲ PA) are used for the voiceless aspirated counterparts. The *galig* letters are used for the voiced unaspirated and aspirated pairs. The Sanskrit repertoire is as follows:

ka	Ⅱ	GA	*ḍa*	Σ	GALIG DDA	*ba*	□	VA
kha	Ⅲ	KA	(*ḍa*	⊣	REVERSED DA)	*bha*	Ⅺ	GALIG BHA
ga	Ⅲ	GALIG GA	*ḍha*	Σ	GALIG DDHA	*ma*	Ⅲ	MA
gha	⅃	GALIG GHA	*ṇa*	⊲	GALIG NNA	*ya*	Ⅲ	YA
ṅa	⊇	NGA	(*ṇa*	⊟	REVERSED NA)	*ra*	ㅠ	RA
ca	Ⅱ	JA	*ta*	⌐	DA	*la*	Ⅲ	LA
cha	Ⅲ	CA	*tha*	日	TA	*va*	⌀	GALIG VA
ja	Ⅰ	GALIG JA	*da*	⊐	GALIG DA	*śa*	ㅒ	SHA
jha	Ⅰ	GALIG JHA	*dha*	⌐	GALIG DHA	*ṣa*	⊞	REVERSED SHA
ña	⊐	NYA	*na*	⊐	NA	*sa*	Ν	SA
ṭa	⊓	GALIG TTA	*pa*	Ⅰ	BA	*ha*	⊓	HA
ṭha	Ⅹ	GALIG TTHA	*pha*	Ⅲ	PA	*kṣa*	⊐	GALIG KSSA

Tibetan is represented by adding the following to the Sanskrit repertoire:

tsa	Ⅱ	GALIG TSA	*dza*	Ε	GALIG DZA	*za*	⊒	GALIG ZA
tsha	Ⅲ	GALIG TSHA	*zha*	⌀	GALIG ZHA	*'a*	⌐	GALIG SMALL A

4.6 Final Consonant Mark

The ◌ FINAL CONSONANT MARK is used for indicating a coda, or syllable-final consonant, in Mongolian. The following are valid codas in Mongolian: Ⅱ *g*, Ⅲ *k*, ⊇ *ṅ*, ⌐ *d*, ⊐ *n*, Ⅰ *b*, Ⅲ *m*, ㅠ *r*, Ⅲ *l*, ㅒ *ś*, Ν *s*. The mark can only attach to a consonant letter. It cannot occur in a consonant cluster.

4.7 Dependent Consonant Sign

The ◌ CONSONANT SIGN FINAL SMALL A is used for writing syllable-final Tibetan ◌ *'a chung*. It attaches to the bottom right corner of a letter, eg. Ⅲ. It also occurs as the glyphic variant ◌ (see figure 11). The sign can occur only after a letter. If it occurs in a consonant cluster, it can only occur in the final position.

4.8 Consonant Conjuncts

Consonant clusters are written as conjuncts, which are rendered as vertical stacks by placing non-initial letters one below the other beneath the initial letter, eg. ⊐ NA + ⊐ GALIG DA is written as 昌 *nda*. Consonants retain their shape in stacks, with the exception of four letters: Ⅲ YA, ㅠ RA, Ⅲ LA, □ VA.

The forms of these letters are determined by their position in a cluster and by the orthography of the source language that is being transcribed. As Mongolian Square is used for transcribing Tibetan and Buddhist Hybrid Sanskrit, these four letters may be written using their regular shape or a contextual form.

1. Ⅲ YA may occur as the subjoined contextual form ◌ and the subjoined full-form ◌ when in the medial or final position of a cluster, eg. Ⅱ GA + Ⅲ YA → Ⅱ *kya* and 卍 *kya*.

2. ᠊ RA may have three different forms in a cluster. Normally, when initial it takes the initial, superfixed shape ⊤, eg. ᠊ RA + ᠊ GA → ᠊ *rga*. It can also occur in its regular full form when initial, eg. ᠊ RA + ᠊ GA → ᠊ (see figure 18). When medial or final in a cluster, RA can occur as the subjoined full-form ᠊ or as the contextual subjoined form ᠊, eg. ᠊ GA + ᠊ RA → ᠊ *kra* and ᠊ *kra*; also ᠊ GA + ᠊ RA + ᠊ YA → ᠊ *krya*. Both renderings of cluster-final RA are used in old Sanskrit-Tibetan lexicons for showing lexical differences.

3. ᠊ LA may occur as the subjoined contextual form ᠊ and the subjoined full-form ᠊ when medial or final in a cluster, eg. ᠊ GA + ᠊ LA → ᠊ *kla* and ᠊ *kla*.

4. ᠊ VA may occur as the subjoined contextual form ᠊ and the subjoined full-form ᠊ when medial or final in a cluster, eg. ᠊ GA + ᠊ VA → ᠊ *kva* and ᠊ *kva*.

4.8.1　Proposed Encoding Model

Given that only four consonants exhibit special shaping behaviors in stacks, while the rest retain their normative shape, the representation of Mongolian Square stacks in encoded text requires a simple subjoining model. The proposed model requires 5 characters for managing all stack possibilities: a control character for indicating subjoining behavior and a set of characters for the contextual forms of YA, RA, LA, VA.

The control character is the ᠊ MONGOLIAN SQUARE SUBJOINER. The SUBJOINER is written before a consonant to indicate that the letter is to be rendered using a subjoined form. Thus, a stack is represented in encoded text as <*consonant*, ᠊ SUBJOINER, *consonant*>, eg. ᠊ *nda* is encoded as <᠊ NA, ᠊ SUBJOINER, ᠊ GALIG DA>. The SUBJOINER is normally not visibly rendered, unless needed for indicating the inability of a font to render a stack (see section 4.8.2).

The model also requires the accommodation of the following forms of YA, RA, LA, VA, which are proposed for encoding as independent characters:

⊤	LETTER INITIAL RA	᠊	LETTER FINAL RA	᠊	LETTER FINAL VA
᠊	LETTER FINAL YA	᠊	LETTER FINAL LA		

The INITIAL RA is written in place of RA in cluster-initial position. It can occur only at the head of a cluster and never independently. The character inherently implies that the following consonant is subjoined, therefore it is not necessary to insert the SUBJOINER before the following consonant. For example, ᠊ *rka* is encoded as <⊤ INITIAL RA, ᠊ GA>, while ᠊ *rka* is encoded as <᠊ RA, ᠊ SUBJOINER, ᠊ GA>.

The letters FINAL YA, FINAL RA, FINAL LA, FINAL VA may occur in the penultimate and final positions in a cluster, and never independently. They are combining characters and as they are inherently subjoined forms, they are not preceded by the ᠊ SUBJOINER For example, ᠊ *tra* is represented in encoded text as <᠊ DA, ᠊ FINAL RA>. These subjoined letters may co-occur, particularly in the penultimate and final positions in a cluster, eg. ᠊ *trya* is represented as <᠊ DA, ᠊ FINAL RA, ᠊ FINAL YA>.

As the initial and final forms are proposed for encoding as independent characters, when the SUBJOINER is placed before YA, RA, LA, VA, the letters will be rendered using subjoined forms of their regular shapes, eg. ᠊, ᠊, ᠊, ᠊.

The proposed model resolves the ambiguity regarding encoded representations for forms such as ᠊ and ᠊, and ᠊ and ᠊, and for the rendering of sequences such as ᠊ RA + ᠊ RA, as well as adjacent pairs of YA, RA, LA, VA in various positions in a cluster without too much processing by the rendering engine.

The proposed encoding model also eliminates the need to adopt the Tibetan subjoined-letter model for Mongolian Square, which would require the independent encoding of a full set of subjoined letters for each consonant letter, in addition to context-specific forms of YA, RA, LA, VA. The decision to encode a INITIAL RA instead of relying on the font to change the shape of RA from full-form to head-position is made in order to eliminate the need to encode two characters with the same nominal appearance, ie. a regular RA and a fixed-form RA, but which have different conjoining behaviors. The proposed model encodes distinctive characters for each distinctive shape of a consonant. All other consonants are rendered in stacks using the SUBJOINER, which simply subjoins one letter beneath the other and does not initiate a shape change of a consonant.

4.8.2   Font Requirements for Rendering Conjuncts

To be considered complete a Mongolian Square font must contain a full set of subjoined forms for each consonant letter. The font will produce a consonant stack by substituting each <⃞ SUBJOINER, *consonant*> pair with a subjoined form of the consonant letter. If the subjoined form of a letter is not available in a font, the SUBJOINER will be visibly displayed along with the regular form of the consonant letter whose subjoined glyph is missing. For example, if the subjoined form ⃞ of �kü_ GALIG DA is unavailable, then a sequence such as <⃞ NA, ⃞ SUBJOINER, ⃞ GALIG DA> will be rendered as ⃞⃞⃞ instead of the expected ⃞.

4.8.3   Positioning of Vowel Signs in Conjuncts

Above-base vowel signs are placed above the initial letter: <⃞ NA, ⃞ GALIG DA, ⃞ VOWEL SIGN I> → ⃞ *ndi*.

Below-base vowel signs are placed beneath the final letter: <⃞ NA, ⃞ GALIG DA, ⃞ VOWEL SIGN U> → ⃞ *ndu*.

The ⃞ VOWEL LENGTH MARK attaches to the final letter: <⃞ NA, ⃞ GALIG DA, ⃞ VOWEL SIGN I, ⃞ VOWEL LENGTH MARK> → ⃞ *ndī*.

4.8.4   Sizing of Letters in Stacks

The size of character glyphs used for rendering a stack may be adjusted for visual uniformity with surrounding characters. There are no formal rules for sizing. By default, there is no size change and the regular forms of letters are used: ⃞ *nda* <⃞ NA, ⃞ SUBJOINER, ⃞ GALIG DA>. In some sources (see figure 16), the normal glyph size of the initial letter is used, while the glyphs of non-initial consonants are compressed along the vertical axis such that their x-height matches that of below-base vowel signs, eg. ⃞. Other sources (see figure 14) illustrate a practice of condensing the glyphs for both the base and subjoined letters so that the height of the stack matches the head-height of surrounding letters, eg. ⃞. Depending on the head-height of surrounding letters, such size adjustments may be practical only for stacks consisting of two letters.

4.8.5   Stack Depth

As Mongolian Square is used for representing Tibetan, consonant stacks may consist of up to 6 or more letters. One such Tibetan stack is *tthddhnra*, which although rare, is attested in religious texts (Fynn [nd]). The Tibetan and Mongolian Square representations of this conjunct are:

Tibetan   Mongolian
Square

The encoded representation of the above stack in Mongolian Square is <Ⱨ DA, ◌ SUBJOINER, ⊟ TA, ◌ SUBJOINER, Ⴝ GALIG DA, ◌ SUBJOINER, Ⱪ GALIG DHA, ◌ SUBJOINER, ⴺ NA, ◌ FINAL RA>.

4.8.6 Conjuncts Shown in Traditional Script Charts

The following conjuncts are shown in traditional script charts: ⴽ *kra*, ⴽ *khya*, ⴽ *gla*, ⴽ *rka*, ⴽ *ska*, ⴽ *lka*. They are not independent characters, but are ligatures that represent consonant conjuncts. It is likely that they are shown for illustrating the use of the contextual subjoined forms of YA, RA, LA and the initial form of RA in the script. The presence of *ska* and *lka* is likely intended to illustrate the representation of Tibetan ལ་མགོ *la-mgo* and ས་མགོ *sa-mgo* letters. These stacks are to be represented in encoded text as:

- ⴽ *kra* = <ⴽ GA, ◌ FINAL RA>

- ⴽ *khya* = <ⴽ KA, ◌ FINAL YA>

- ⴽ *gla* = <ⴽ GALIG GA, ◌ FINAL LA>

- ⴽ *rka* = <◌ INITIAL RA, ⴽ GA>

- ⴽ *ska* = <ⴺ SA, ◌ SUBJOINER, ⴽ GA>; this is a stylized ligated form of the stack ⴽ.

- ⴽ *lka* = <ⴽ LA, ◌ SUBJOINER, ⴽ GA>; this is a stylized ligated form of the stack ⴽ.

4.9 Various Signs

The following combining signs are used for writing Sanskrit:

◌ **SIGN ANUSVARA**   This sign is used for indicating nasalization in Sanskrit words.

◌ **SIGN VISARGA**   This sign is used for indicating post-vocalic aspiration in Sanskrit words.

4.10 Punctuation

The following characters are used for punctuation:

˙ **TSHEG**   marks the end of a syllable. It corresponds to ˙ U+0F0B TIBETAN MARK INTERSYLLABIC TSHEG.

| **SHAD**   indicates the end of a phrase or sentence. It corresponds to | U+0F0D TIBETAN MARK SHAD.

9

‖ **DOUBLE SHAD**   indicates the end of a text section (see figure 14). It corresponds to ‖ U+0F0E TIBETAN MARK NYIS SHAD.

4.11   Head Mark

The 𖢅 HEAD MARK is used at the beginning of a text. It is generally followed by ∣ SHAD and written as 𖢅∣.

4.12   Digits

Digits are not attested. Sources do not indicate the use of digits or number forms in the script.

5   Character Data

5.1   Character Properties

Character properties given in the data format of `UnicodeData.txt`:

```
11860;MONGOLIAN SQUARE LETTER A;Lo;0;L;;;;;N;;;;;
11861;MONGOLIAN SQUARE VOWEL SIGN I;Mn;0;NSM;;;;;N;;;;;
11862;MONGOLIAN SQUARE VOWEL SIGN E;Mn;0;NSM;;;;;N;;;;;
11863;MONGOLIAN SQUARE VOWEL SIGN UE;Mn;0;NSM;;;;;N;;;;;
11864;MONGOLIAN SQUARE VOWEL SIGN U;Mn;0;NSM;;;;;N;;;;;
11865;MONGOLIAN SQUARE VOWEL SIGN O;Mn;0;NSM;;;;;N;;;;;
11866;MONGOLIAN SQUARE VOWEL SIGN OE;Mn;0;NSM;;;;;N;;;;;
11867;MONGOLIAN SQUARE VOWEL SIGN AI;Mc;0;L;;;;;N;;;;;
11868;MONGOLIAN SQUARE VOWEL SIGN AU;Mc;0;L;;;;;N;;;;;
11869;MONGOLIAN SQUARE REVERSED VOWEL SIGN I;Mn;0;NSM;;;;;N;;;;;
1186A;MONGOLIAN SQUARE VOWEL LENGTH MARK;Mc;0;L;;;;;N;;;;;
1186B;MONGOLIAN SQUARE LETTER GA;Lo;0;L;;;;;N;;;;;
1186C;MONGOLIAN SQUARE LETTER KA;Lo;0;L;;;;;N;;;;;
1186D;MONGOLIAN SQUARE LETTER NGA;Lo;0;L;;;;;N;;;;;
1186E;MONGOLIAN SQUARE LETTER JA;Lo;0;L;;;;;N;;;;;
1186F;MONGOLIAN SQUARE LETTER CA;Lo;0;L;;;;;N;;;;;
11870;MONGOLIAN SQUARE LETTER NYA;Lo;0;L;;;;;N;;;;;
11871;MONGOLIAN SQUARE LETTER DA;Lo;0;L;;;;;N;;;;;
11872;MONGOLIAN SQUARE LETTER TA;Lo;0;L;;;;;N;;;;;
11873;MONGOLIAN SQUARE LETTER NA;Lo;0;L;;;;;N;;;;;
11874;MONGOLIAN SQUARE LETTER BA;Lo;0;L;;;;;N;;;;;
11875;MONGOLIAN SQUARE LETTER PA;Lo;0;L;;;;;N;;;;;
11876;MONGOLIAN SQUARE LETTER MA;Lo;0;L;;;;;N;;;;;
11877;MONGOLIAN SQUARE LETTER YA;Lo;0;L;;;;;N;;;;;
11878;MONGOLIAN SQUARE LETTER RA;Lo;0;L;;;;;N;;;;;
11879;MONGOLIAN SQUARE LETTER LA;Lo;0;L;;;;;N;;;;;
1187A;MONGOLIAN SQUARE LETTER VA;Lo;0;L;;;;;N;;;;;
1187B;MONGOLIAN SQUARE LETTER SHA;Lo;0;L;;;;;N;;;;;
1187C;MONGOLIAN SQUARE LETTER SA;Lo;0;L;;;;;N;;;;;
1187D;MONGOLIAN SQUARE LETTER HA;Lo;0;L;;;;;N;;;;;
1187E;MONGOLIAN SQUARE LETTER GALIG KSSA;Lo;0;L;;;;;N;;;;;
1187F;MONGOLIAN SQUARE LETTER GALIG TTA;Lo;0;L;;;;;N;;;;;
11880;MONGOLIAN SQUARE LETTER GALIG TTHA;Lo;0;L;;;;;N;;;;;
11881;MONGOLIAN SQUARE LETTER GALIG DDA;Lo;0;L;;;;;N;;;;;
11882;MONGOLIAN SQUARE LETTER GALIG DDHA;Lo;0;L;;;;;N;;;;;
11883;MONGOLIAN SQUARE LETTER GALIG NNA;Lo;0;L;;;;;N;;;;;
11884;MONGOLIAN SQUARE LETTER GALIG ZHA;Lo;0;L;;;;;N;;;;;
11885;MONGOLIAN SQUARE LETTER GALIG ZA;Lo;0;L;;;;;N;;;;;
```

```
11886;MONGOLIAN SQUARE LETTER GALIG SMALL A;Lo;0;L;;;;;N;;;;;
11887;MONGOLIAN SQUARE LETTER GALIG GA;Lo;0;L;;;;;N;;;;;
11888;MONGOLIAN SQUARE LETTER GALIG GHA;Lo;0;L;;;;;N;;;;;
11889;MONGOLIAN SQUARE LETTER GALIG JA;Lo;0;L;;;;;N;;;;;
1188A;MONGOLIAN SQUARE LETTER GALIG JHA;Lo;0;L;;;;;N;;;;;
1188B;MONGOLIAN SQUARE LETTER GALIG VA;Lo;0;L;;;;;N;;;;;
1188C;MONGOLIAN SQUARE LETTER GALIG DA;Lo;0;L;;;;;N;;;;;
1188D;MONGOLIAN SQUARE LETTER GALIG DHA;Lo;0;L;;;;;N;;;;;
1188E;MONGOLIAN SQUARE LETTER GALIG BHA;Lo;0;L;;;;;N;;;;;
1188F;MONGOLIAN SQUARE LETTER GALIG TSA;Lo;0;L;;;;;N;;;;;
11890;MONGOLIAN SQUARE LETTER GALIG TSHA;Lo;0;L;;;;;N;;;;;
11891;MONGOLIAN SQUARE LETTER GALIG DZA;Lo;0;L;;;;;N;;;;;
11892;MONGOLIAN SQUARE REVERSED LETTER DA;Lo;0;L;;;;;N;;;;;
11893;MONGOLIAN SQUARE REVERSED LETTER NA;Lo;0;L;;;;;N;;;;;
11894;MONGOLIAN SQUARE REVERSED LETTER SHA;Lo;0;L;;;;;N;;;;;
11895;MONGOLIAN SQUARE SUBJOINER;Mn;9;NSM;;;;;N;;;;;
11896;MONGOLIAN SQUARE SIGN ANUSVARA;Mn;0;NSM;;;;;N;;;;;
11897;MONGOLIAN SQUARE SIGN VISARGA;Mc;0;L;;;;;N;;;;;
11898;MONGOLIAN SQUARE FINAL CONSONANT MARK;Mn;0;NSM;;;;;N;;;;;
11899;MONGOLIAN SQUARE CONSONANT SIGN FINAL SMALL A;Mn;0;NSM;;;;;N;;;;;
1189A;MONGOLIAN SQUARE LETTER INITIAL RA;Lo;0;L;;;;;N;;;;;
1189B;MONGOLIAN SQUARE LETTER FINAL YA;Mn;0;NSM;;;;;N;;;;;
1189C;MONGOLIAN SQUARE LETTER FINAL RA;Mn;0;NSM;;;;;N;;;;;
1189D;MONGOLIAN SQUARE LETTER FINAL LA;Mn;0;NSM;;;;;N;;;;;
1189E;MONGOLIAN SQUARE LETTER FINAL VA;Mn;0;NSM;;;;;N;;;;;
1189F;MONGOLIAN SQUARE HEAD MARK;Po;0;ON;;;;;N;;;;;
118A0;MONGOLIAN SQUARE TSHEG;Po;0;L;;;;;N;;;;;
118A1;MONGOLIAN SQUARE SHAD;Po;0;L;;;;;N;;;;;
118A2;MONGOLIAN SQUARE DOUBLE SHAD;Po;0;L;;;;;N;;;;;
```

5.2   Linebreaking Properties

Linebreaking properties given in the data format of `LineBreak.txt`:

```
11860;         AL      # LETTER A
11861..1186A; CM       # VOWEL SIGN I .. VOWEL LENGTH MARK
1186B..11894; AL       # LETTER GA .. REVERSED LETTER SHA
11895; CM              # SUBJOINER
11896..11899; CM       # SIGN ANUSVARA .. CONSONANT SIGN FINAL SMALL A
1189A..1189E; AL       # LETTER INITIAL RA .. LETTER FINAL VA
1189F; BB              # HEAD MARK
118A0..118A2; BA       # TSHEG .. DOUBLE SHAD
```

5.3   'Confusable' Characters

Some Mongolian Square letters resemble those found in other scripts encoded in the UCS:

```
1186D MONGOLIAN SQUARE LETTER NGA              ;  A843 PHAGS-PA LETTER NGA
11879 MONGOLIAN SQUARE LETTER LA               ;  A859 PHAGS-PA LETTER LA
1187C MONGOLIAN SQUARE LETTER SA               ;  004E LATIN CAPITAL LETTER N
11885 MONGOLIAN SQUARE LETTER GALIG ZA         ;  018E LATIN CAPITAL LETTER REVERSED E
11885 MONGOLIAN SQUARE LETTER GALIG ZA         ;  A855 PHAGS-PA LETTER ZA
11886 MONGOLIAN SQUARE LETTER GALIG SMALL A    ;  A855 PHAGS-PA LETTER SMALL A
1188A MONGOLIAN SQUARE LETTER GALIG JHA        ;  A846 PHAGS-PA LETTER JA
11891 MONGOLIAN SQUARE LETTER GALIG DZA        ;  0045 LATIN CAPITAL LETTER E
1189A MONGOLIAN SQUARE LETTER INITIAL RA       ;  A872 PHAGS-PA SUPERFIXED LETTER RA
1189C MONGOLIAN SQUARE LETTER FINAL RA         ;  A871 PHAGS-PA SUBJOINED LETTER RA
1189F MONGOLIAN SQUARE HEAD MARK               ;  A874 PHAGS-PA SINGLE HEAD MARK
```

```
118A0 MONGOLIAN SQUARE TSHEG              ;  0F0B TIBETAN MARK INTERSYLLABIC TSHEG
118A1 MONGOLIAN SQUARE SHAD               ;  0F0D TIBETAN MARK SHAD
118A2 MONGOLIAN SQUARE DOUBLE SHAD        ;  0F0E TIBETAN MARK NYIS SHAD
```

There is one internal 'confusable':

```
11866 MONGOLIAN SQUARE SIGN OE  ;  11896 MONGOLIAN SQUARE LETTER SUPERFIXED RA
```

6   References

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7   Acknowledgments

	1186	1187	1188	1189	118A
0	ᶶ 11860	ᡱ 11870	ᢀ 11880	ᢐ 11890	˙ 118A0
1	ᶸ 11861	ᡱ 11871	ᢁ 11881	ᢑ 11891	ǀ 118A1
2	ᶹ 11862	ᡲ 11872	ᢂ 11882	ᢒ 11892	ǁ 118A2
3	ᶺ 11863	ᡳ 11873	ᢃ 11883	ᢓ 11893	
4	ᶻ 11864	ᡴ 11874	ᢄ 11884	ᢔ 11894	
5	ᶼ 11865	ᡵ 11875	ᢅ 11885	ᢕ 11895	
6	ᶽ 11866	ᡶ 11876	ᢆ 11886	ᢖ 11896	
7	ᶾ 11867	ᡷ 11877	ᢇ 11887	ᢗ 11897	
8	ᶿ 11868	ᡸ 11878	ᢈ 11888	ᢘ 11898	
9	᷀ 11869	᡹ 11879	ᢉ 11889	ᢙ 11899	
A	᷁ 1186A	᡺ 1187A	ᢊ 1188A	ᢚ 1189A	
B	᷂ 1186B	᡻ 1187B	ᢋ 1188B	ᢛ 1189B	
C	᷃ 1186C	᡼ 1187C	ᢌ 1188C	ᢜ 1189C	
D	᷄ 1186D	᡽ 1187D	ᢍ 1188D	ᢝ 1189D	
E	᷅ 1186E	᡾ 1187E	ᢎ 1188E	ᢞ 1189E	
F	᷆ 1186F	᡿ 1187F	ᢏ 1188F	ᢟ 1189F	

The script is also known as the Mongolian Horizontal Square Script, or Xewtee Dörböljin in Mongolian.

Vowel letter

11860 ᡪ MONGOLIAN SQUARE LETTER A
    • used for representing independent vowels in combination with vowel signs

Vowel signs

11861 ᢷ MONGOLIAN SQUARE VOWEL SIGN I
11862 ᢸ MONGOLIAN SQUARE VOWEL SIGN E
11863 ᢹ MONGOLIAN SQUARE VOWEL SIGN UE
11864 ᢺ MONGOLIAN SQUARE VOWEL SIGN U
11865 ᢻ MONGOLIAN SQUARE VOWEL SIGN O
11866 ᢼ MONGOLIAN SQUARE VOWEL SIGN OE
11867 ᢽ MONGOLIAN SQUARE VOWEL SIGN AI
11868 ᢾ MONGOLIAN SQUARE VOWEL SIGN AU

Reversed vowel sign

11869 ᢿ MONGOLIAN SQUARE REVERSED VOWEL SIGN I
    • used for Sanskrit vocalic sounds

Vowel length mark

1186A ᡌ MONGOLIAN SQUARE VOWEL LENGTH MARK

Consonants

1186B ᡋ MONGOLIAN SQUARE LETTER GA
    • used for Sanskrit ka
1186C ᡌ MONGOLIAN SQUARE LETTER KA
    • used for Sanskrit kha
1186D ᡍ MONGOLIAN SQUARE LETTER NGA
1186E ᡎ MONGOLIAN SQUARE LETTER JA
    • used for Sanskrit ca
1186F ᡏ MONGOLIAN SQUARE LETTER CA
    • used for Sanskrit cha
11870 ᡐ MONGOLIAN SQUARE LETTER NYA
11871 ᡑ MONGOLIAN SQUARE LETTER DA
    • used for Sanskrit ta
11872 ᡒ MONGOLIAN SQUARE LETTER TA
    • used for Sanskrit tha
11873 ᡓ MONGOLIAN SQUARE LETTER NA
11874 ᡔ MONGOLIAN SQUARE LETTER BA
    • used for Sanskrit pa
11875 ᡕ MONGOLIAN SQUARE LETTER PA
    • used for Sanskrit pha
11876 ᡖ MONGOLIAN SQUARE LETTER MA
11877 ᡗ MONGOLIAN SQUARE LETTER YA
11878 ᡘ MONGOLIAN SQUARE LETTER RA
11879 ᡙ MONGOLIAN SQUARE LETTER LA
1187A ᡚ MONGOLIAN SQUARE LETTER VA
    • used for Sanskrit ba
1187B ᡛ MONGOLIAN SQUARE LETTER SHA
1187C ᡜ MONGOLIAN SQUARE LETTER SA
1187D ᡝ MONGOLIAN SQUARE LETTER HA
1187E ᡞ MONGOLIAN SQUARE LETTER GALIG KSSA
1187F ᡟ MONGOLIAN SQUARE LETTER GALIG TTA
11880 ᡠ MONGOLIAN SQUARE LETTER GALIG TTHA
11881 ᡡ MONGOLIAN SQUARE LETTER GALIG DDA
11882 ᡢ MONGOLIAN SQUARE LETTER GALIG DDHA
11883 ᡣ MONGOLIAN SQUARE LETTER GALIG NNA
11884 ᡤ MONGOLIAN SQUARE LETTER GALIG ZHA
11885 ᡥ MONGOLIAN SQUARE LETTER GALIG ZA
11886 ᡦ MONGOLIAN SQUARE LETTER GALIG SMALL A
    • used for Tibetan a-chung

11887 ᡧ MONGOLIAN SQUARE LETTER GALIG GA
11888 ᡨ MONGOLIAN SQUARE LETTER GALIG GHA
11889 ᡩ MONGOLIAN SQUARE LETTER GALIG JA
1188A ᡪ MONGOLIAN SQUARE LETTER GALIG JHA
1188B ᡫ MONGOLIAN SQUARE LETTER GALIG VA
1188C ᡬ MONGOLIAN SQUARE LETTER GALIG DA
1188D ᡭ MONGOLIAN SQUARE LETTER GALIG DHA
1188E ᡮ MONGOLIAN SQUARE LETTER GALIG BHA
1188F ᡯ MONGOLIAN SQUARE LETTER GALIG TSA
11890 ᡰ MONGOLIAN SQUARE LETTER GALIG TSHA
11891 ᡱ MONGOLIAN SQUARE LETTER GALIG DZA

Reversed consonants

11892 ᡲ MONGOLIAN SQUARE REVERSED LETTER DA
    • used for Sanskrit retroflex ta
11893 ᡳ MONGOLIAN SQUARE REVERSED LETTER NA
    • used for Sanskrit retroflex na
11894 ᡴ MONGOLIAN SQUARE REVERSED LETTER SHA
    • used for Sanskrit retroflex sa

Subjoiner

11895 ᢆ MONGOLIAN SQUARE SUBJOINER
    • used for representing conjuncts
    • indicates that the following letter is to be rendered as a subjoined form
    • is not visibly rendered

Various signs

11896 ᢇ MONGOLIAN SQUARE SIGN ANUSVARA
11897 ᢈ MONGOLIAN SQUARE SIGN VISARGA

Final consonant mark

11898 ᢉ MONGOLIAN SQUARE FINAL CONSONANT MARK

Dependent consonant sign

11899 ᢊ MONGOLIAN SQUARE CONSONANT SIGN FINAL SMALL A
    • used for Tibetan syllable-final a-chung

Superfixed initial consonant

Used only in conjuncts

1189A ᢋ MONGOLIAN SQUARE LETTER INITIAL RA

Subjoined final consonants

Used only in conjuncts

1189B ᢌ MONGOLIAN SQUARE LETTER FINAL YA
1189C ᢍ MONGOLIAN SQUARE LETTER FINAL RA
1189D ᢎ MONGOLIAN SQUARE LETTER FINAL LA
1189E ᢏ MONGOLIAN SQUARE LETTER FINAL VA

Head mark

1189F ᢐ MONGOLIAN SQUARE HEAD MARK

Punctuation

118A0 ᢑ MONGOLIAN SQUARE TSHEG
    → 0F0B ་ tibetan mark intersyllabic tsheg
118A1 ᢒ MONGOLIAN SQUARE SHAD
    → 0964 । devanagari danda
118A2 ᢓ MONGOLIAN SQUARE DOUBLE SHAD
    → 0965 ॥ devanagari double danda

Figure 1: Characters of the Mongolian Square script (from Kara 1972: 96). Note the variant form ⌢○ for ○̇ VOWEL SIGN I.

Figure 2: Characters of the Mongolian Square script (from Kapaj 2002).

гэдэг өгүүлэлдээ тодруулан өгчээ. Академич Ринчен ийнхүү тодруулахдаа Угалзын лам хэмээн олонд алдаршсан Лувсансодовжамц (1878-1961)-ын *"Yig-bçad gsal bai'i me-long źes bya ba bzuǵs-so"* буюу хэвтээ дөрвөлжин бичгийн тайлбар болгож зохиосон *"Үсэгийн номлол тодорхой толь хэмээх оршивой"* гэдэг гар бичмэл номын[10] мэдээнд үндэслэсэн буй заа.

Хэвтээ дөрвөлжин бичгээр үлдсэн дурсгал гэвэл 1972 оныг хүртэл хэдэн зүйл хэсэг бусаг цагаан толгой, нэгэн зүйл тарнийн үсгээс өөр тоймтой баримт олдоогүй байсан гэж хэлж болно. 1972 онд проф. Д. Кара *"Книги монгольских кочевников"* номдоо хэвтээ дөрвөлжин бичгийн цагаан толгойд үсэгзүйн ажиглалт хийж, дуудалгын латин галигийн хамт анхлан судлагааны хүрээнд танилцуулж Жамсраны Цэвээн авгайн цуглуулгаас олдсон монгол хэлээр, хэвтээ дөрвөлжин бичгээр буй "<u>А-му-гу-ла-н-ту та-ма-га</u>"-ын дардасыг хавсаргажээ[11] (3-р хавсралтаас үзмүү).

Хэдэн жилийн дараа энэ номын зохиогч Гандан хийдийн ламтан Данзан-осор гуайн цуглуулгад байсан самгард хэл, бичгээрхи ханын чимэгийн эцэс дэхи хэвтээ дөрвөлжин бичгээр, монгол хэлээр буй бичвэрийг олж судлагааны эргэлтэнд оруулсан билээ[12]. Монгол хэлээрхи эл дурсгалын талаар хойно арай дэлгэрүүлэн өгүүлэх болно.

1997 онд судлагч Р. Бямбаа хэвтээ дөрвөлжин бичгээр төвед, монгол, самгард хэлээр буй дурсгалуудыг нэгтгэн судлаж *"Хэвтээ дөрвөлжин үсэг, түүний дурсгалууд"* гэдэг бие даасан тусгай ном нийтлүүлсэн бөгөөд үүндээ уг бичигт холбогдох мэдээ баримтыг багтаан оруулжээ[13]. Энэ жишилэнгээр сүүлийн үес монгол, төвед, самгард хэлээр хэвтээ дөрвөлжин үсгээр бичсэн дурсгалын зүйл мэр сэр нэмэгдсээр байна.

Хэвтээ дөрвөлжин бичиг, түүгээр үлдсэн монгол хэлний дурсгалын ач холбогдолын тухайд гэвэл түрүүчийн бөлөгт соёмбо бичгийн баримт дурсгал монгол хэлний түүхэнд хэрхэн холбогдох талаар Л. Лигети академичийн хэлсэнтэй агаар нэгэн мөр тул дахин нурших хэрэггүй. Харин үсэгзүйн үүднээс төвед, самгард үсэг бичигтэй харьцуулан тодруулах зүйл багагүйгээр барахгүй бас 1444/1446 оны солонгос бичигийн зарчимтай төстэй зүйл харагддаг[14] нь шууд буюу эсбөгөөс Төв Ази дахины бусад бичиг үсгийн уламжлалтай дам холбоотойн алин болохыг энэ хир шийдээгүй боловч бас анхааралгүй орхиж болохгүй гэж санаж байна.

Хэвтээ дөрвөлжин бичигийн цагаан толгой

 Хуудас эхлэсний буюу хуудасны өвөр талын тэмдэг. Бярга буюу эгчимтэй адил үүрэг гүйцэтгэнэ.

1. **tl.** A;
tc. mong., tib., sans.: а. Энэ нь а эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд   тохиолдоно.

 tl. a_0;
tc. а. Энэ нь а эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдох нууц буюу тэг хэлбэр.

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[10] Р. Бямбаа, *Хэвтээ дөрвөлжин үсэг, түүний дурсгалууд*, Улаанбаатар, 1997, х.22-38.

[11] Д. Кара, *"Книги монгольских кочевников"*, Москва, 1972, стр. 93-96.

[12] Ц. Шагдарсүрэн, *Монгол үсэг зүй*, Тэргүүн дэвтэр, Улаанбаатар, 1981, 108-110; Ц. Шагдарсүрэн, *Об одном новонайденном памятнике горизонтально-квадратного письма*, - Монгольский лингвистический сборник, Москва, 1985, стр. 150 - 154.

[13] Р. Бямбаа, *Хэвтээ дөрвөлжин үсэг, түүний дурсгалууд*, Улаанбаатар, 1997, 90 х.

[14] Ц. Шагдарсүрэн, *Монгол солонгос бичиг үсгийн харилцаа холбооны асуудалд*, - Mongolian Studies (The Korean Association for Mongol Studies), N. 4 (1996), Soeul, 1997, 169-192 х; Ts. Shagdarsurung, *A Study of Relation between the Korean and Mongolian Scripts*, The Research Paper to The Korea Foundation, Seoul, 1998, pp. 1-27.

Figure 3: Description of Mongolian Square letters (from Shagdarsürüng 2001: 160).

1.a.   **tl.** Ā;
tc. mong., sans.: ā. Урт а эгшигийн бие даасан буюу (IF) хэлбэр.

tl. ā₀;
tc. ā. Энэ нь урт ā эгшигийн нууц буюу тэг (Ø) хэлбэр.

2.   **tl.** I;
tc. mong., tib., sans.: i. Энэ нь i эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

tl. i;
tc. i. i эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдоно.

2.a.   **tl.** Ī;
tc. mong., sans.: ī. Урт ī эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

tl. ī.
tc. ī. Урт ī эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдоно.

3.   **tl.** E;
tc. mong., tib.: e; sans. (diphtongue) e. Энэ нь монгол, төвөд хэлний e эгшиг, самгард хэлний хос e эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

tl. e;
tc. e. Энэ нь e эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдоно.

3.a.   **tl.** Ē;
tc. mong.: ē; sans: (diphtongue) ai. Монгол хэлний урт ē, самгард хэлний хос ai эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

tl. ē;
tc. ē / ai; Монгол хэлний урт ē, самгард хэлний хос ai эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдоно.

4.   **tl.** mong., tib.: Ü; sans.: U;
tc. mong., tib.: ü; sans.: u. Монгол, төвөд хэлний ü эгшиг, самгард хэлний u эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

tl. mong., tib.: ü; sans. u;
tc. mong., tib.: ü; sans. u; Монгол, төвөд хэлний ü эгшиг, самгард хэлний u эгшигийн гол буюу (MF) хэлбэр. Үг буюу үеийн дунд, адагт тохиолдоно.

4.a.   **tl.** mong. Ū; sans.: ū;
tc. mong. ū; sans. ū; Монгол хэлний урт ü эгшиг, самгард хэлний урт ū эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

Figure 4: Description of Mongolian Square letters (from Shagdarsürüng 2001: 161).

tl. mong. ū̄; sans. ū;

tc. mong. ū̄; sans. ū. Монгол, хэлний урт ū эгшиг, самгард хэлний урт ū эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд, адагт тохиолдоно.

5.   tl. mong. U;

tc. mong. u. Монгол хэлний u эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үейн эхинд тохиолдоно.

tl. mong. u;

tc. mong. u. U эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд болоод адагт тохиолдоно.

5.a.   tl. mong. ū;

tc. mong. ū. Монгол хэлний урт ū эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үейн эхинд тохиолдоно.

tl. mong. ū;

tc. mong. ū. Монгол хэлний урт ū эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд болоод адагт тохиолдоно.

6.   tl. mong., tib., O; sans. (diphtongue) O;

tc. mong., tib. o; sans. (diphtongue) o. Энэ нь монгол, төвед хэлний o эгшиг, самгард хэлний хос o эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үейн эхинд тохиолдоно.

tl. mong., tib. o; sans. (diphtongue) o;

tc. mong., tib. o; sans. (diphtongue) o. Энэ нь монгол, төвед хэлний o эгшиг, самгард хэлний хос o эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд болоод адагт тохиолдоно.

6.a.   tl. mong. ō; sans. (diphtongue) AU;

tc. mong. ō; sans. (diphtongue) au. Энэ нь монгол хэлний урт ō эгшиг, самгард хэлний хос au эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үейн эхинд тохиолдоно.

tl. mong. ō; sans. (diphtongue) au;

tc. mong. ō; sans. (diphtongue) au. Энэ нь монгол хэлний урт ō эгшиг, самгард хэлний хос au эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд болоод адагт тохиолдоно.

7.   tl. mong. Ö;

tc. mong. ö. Энэ нь монгол хэлний ö эгшигийн бие даасан буюу (IF) хэлбэр. Үг буюу үейн эхинд тохиолдоно.

tl. mong. ö;

tc. mong. ö. Энэ нь монгол хэлний ö эгшигийн гол буюу (MF) хэлбэр. Үг буюу үейн дунд болоод адагт тохиолдоно.

Figure 5: Description of Mongolian Square letters (from Shagdarsürüng 2001: 162).

7.a.   **tl.** mong. Ō̄:
       tc. mong. ō̄. Энэ нь монгол хэлний урт ö эгшигийн бие даасан буюу (IF)
       хэлбэр хэлбэр. Үг буюу үеийн эхинд тохиолдоно.

       tl. mong. ō̄:
       tc. mong. ō̄. Энэ нь монгол хэлний урт ö эгшигийн гол буюу (MF) хэлбэр. Үг
       буюу үеийн дунд болоод адагт тохиолдоно

8.   **tl.** Au₁:
       tc. mong. au (буюу diphtongue waw). Монгол хэлнээ тохиолдоно. (Энэ
       хэлбэрийг жагсаалтын No. 5-д дурдсан u эгшигтэй харьцуулагтун).

9.   **tl.** Ai₁:
       tc. mong. ai (буюу diphtongue yod). Монгол хэлнээ тохиолдоно. (Энэ
       хэлбэрийг жагсаалтын No. 2-т дурдсан i эгшигтэй харьцуулагтун).

10.   **tl.** mong. G(a); tib., sans.: K(a):
       tc. mong. ga; tib., sans. ka. Монгол хэлний   ga, төвед, самгард хэлний ka
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

11.   **tl.** mong. K(a), tib., sans.: KH(a);
       tc. mong. ka, tib., sans.: kha. Монгол хэлний ka, төвед, самгард хэлний kha
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

12.   **tl.** (mong. ṇ), tib., sans.: Ṅ(a);
       tc. mong., tib., sans.: ṇa. Монгол хэлнээ үгийн буюу үеийн эхинд
       тохиолддоггүй. Төвед, самгард хэлний ṅa гийгүүлэгчийн бие даасан (IF)
       хэлбэр. Монгол хэлний тухайд зөвхөн гол буюу (MF) хэлбэрээр тохиолдоно.

13.   **tl.** mong. J(a), tib., sans.: C(a);
       tc. mong. ja, tib., sans.: ca. Монгол хэлний ja, төвед, самгард хэлний ca
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

14.   **tl.** mong. C(a); tib., sans.: CH(a);
       tc. mong. ca, tib., sans.: cha. Монгол хэлний ca, төвед, самгард хэлний cha
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

15.   **tl.** tib., sans.: N̄(a);
       tc. tib., sans.: n̄a. Төвед, самгард хэлний n̄a гийгүүлэгчийн бие даасан (IF)
       хэлбэр.

16.   **tl.** mong., D(a), tib., sans. T(a);
       tc. mong. da, tib., sans.: ta. Монгол хэлний da, төвед, самгард хэлний ta
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

17.   **tl.** mong. T(a), tib., sans. TH(a);
       tc. mong. ta, tib., sans. tha. Монгол хэлний ta, төвед, самгард хэлний tha
       гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

Figure 6: Description of Mongolian Square letters (from Shagdarsürüng 2001: 163).

21

18. **tl.** mong., tib., sans. N(a);
tc. mong., tib., sans. na. Монгол, төвөд, самгард хэлний na гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

19. **tl.** mong. ba, tib., sans.: P(a);
tc. mong. ba, tib., sans.: pa. Монгол хэлний ba, төвөд, самгард хэлний pa гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

20. **tl.** mong. P(a), tib., sans. PH(a);
tc. mong. pa, tib., sans.: pha. Монгол хэлний pa, төвөд, самгард хэлний pha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

21. **tl.** mong., tib., sans. M(a);
tc. mong., tib., sans. ma. Монгол, төвөд, самгард хэлний ma гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

22. **tl.** mong., tib.: Y(a), sans. (semi-vowel) Y(a);
tc. mong., tib.: ya, sans. (semi-vowel) ya. Монгол, төвөд хэлний уа, самгард хэлний тал (буюу хагас) уа гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

23. **tl.** mong., tib.: R(a), sans. (semi-vowel) R(a);
tc. mong., tib.: ra, sans.: (semi-vowel) ra. Монгол, төвөд хэлний га, самгард хэлний тал (буюу хагас) га гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

24. **tl.** mong., tib., L(a), sans.; (semi-vowel) L(a);
tc. mong., tib., la, sans.: (semi-vowel) la. Монгол, төвөд хэлний la, самгард хэлний тал (буюу хагас) la гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

25. **tl.** mong., tib., V(a), sans.; (semi-vowel) V(a);
tc. mong., tib., va, sans.: (semi-vowel) va. Монгол, төвөд хэлний va, самгард хэлний тал (буюу хагас) va гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

26. **tl.** mong. š(a), tib., sans.: ç(a) / Ś(a).
tc. mong. ša, tib., sans.: ça / sa. Монгол хэлний ša, төвөд, самгард хэлний ça / sa гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

27. **tl.** mong., tib., sans. S(a);
tc. mong., tib., sans. sa. Монгол, төвөд, самгард хэлний sa гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

28. **tl.** mong., tib. H(a), sans.: (semi-vowel) H(a);
tc. mong., tib., ha, sans: (semi-vowel) ha. Монгол, төвөд хэлний ha, самгард хэлний тал (буюу хагас) ha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

29. **tl.** sans. KS(a);
tc. sans. ksa. Самгард хэлний ksa гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

Figure 7: Description of Mongolian Square letters (from Shagdarsürüng 2001: 164).

30. **tl.** sans. T(a);
tc. sans. ta. Самгард хэлний ta гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

31. **tl.** sans. TH(a);
tc.sans. tha. Самгард хэлний tha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

32. **tl.** sans. D(a);
tc. sans. da. Самгард хэлний da гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

33. **tl.** sans. DH(a);
tc. sans. dha. Самгард хэлний dha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

34. **tl.** sans. N(a);
tc. sans. na. Самгард хэлний na гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

35. **tl.** tib. Z(a);
tc. tib. za. Төвөд хэлний za гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

36. **tl.** tib. Z(a);
tc. tib. za. Төвөд хэлний za гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

37. **tl.** tib. '(a);
tc. tib. 'a. Төвөд хэлний 'a-čhun буюу шанаган "a" гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

38. **tl.** tib., sans.: G(a);
tc. tib., sans.: ga. Төвөд, самгард хэлний ga гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

39. **tl.** sans. GH(a);
tc. sans. gha. Самгард хэлний gha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

40. **tl.** tib., sans.: J(a);
tc. tib., sans.: ja. Төвөд, самгард хэлний ja гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

41. **tl.** sans. JH(a);
tc. sans. jha. Самгард хэлний jha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

42. **tl.** sans. S(a);
tc. sa (?). Самгард хэлний sa (?) гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

Figure 8: Description of Mongolian Square letters (from Shagdarsürüng 2001: 165).

43. **tl.** sans. D(a);
tc. sans. da. Самгард хэлний da гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

44. **tl.** sans. DH(a);
tc. sans. dha. Самгард хэлний dha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

45. **tl.** sans. B(a) / P(a);
tc. sans. ba / pa. Самгард хэлний ba / pa гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

46. **tl.** sans. BH(a);
tc. sans. bha. Самгард хэлний bha гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

47. **tl.** sans. R / Ri;
tc. sans. r / ri. Самгард хэлний r / ri эгшигийн бие даасан буюу (IF) хэлбэр.

tl. sans. r / ri;
tc. sans. r /ri. Самгард хэлний r / ri эгшигийн гол буюу (MF) хэлбэр. Yr буюу үеийн дунд, адагт тохиолдоно.

47.a. **tl.** sans. R / Ri;
tc. sans. r / ri. Самгард хэлний урт r / ri эгшигийн бие даасан буюу (IF) хэлбэр.

tl. sans. R / Ri;
tc. sans. r / ri. Самгард хэлний урт r / ri эгшигийн гол буюу (MF) хэлбэр. Yr буюу үеийн дунд, адагт тохиолдоно.

48. **tl.** sans. L / Li;
tc. sans. l / li. Самгард хэлний l / li эгшигийн бие даасан буюу (IF) хэлбэр.

tl. sans. l / li;
tc. sans. l / li. Самгард хэлний l / li эгшигийн гол буюу (MF) хэлбэр. Yr буюу үеийн дунд, адагт тохиолдоно.

48.a. **tl.** sans. L / Li;
tc. sans. l / li. Самгард хэлний урт l / li эгшигийн бие даасан буюу (IF) хэлбэр.

tl. sans. L / Li;
tc. sans. l / li. Самгард хэлний урт l / li эгшигийн гол буюу (MF) хэлбэр. Yr буюу үеийн дунд, адагт тохиолдоно.

49. **tl.** tib., sans. Kr(a);
tc. tib., sans. kra. Төвөд, самгард хэлний нийлмэл (буюу га зүүлтэт) kra гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

Figure 9: Description of Mongolian Square letters (from Shagdarsürüng 2001: 166). Note the use of ◌ ʀᴇᴠᴇʀsᴇᴅ ᴠᴏᴡᴇʟ sɪɢɴ ɪ for writing r, $\bar{r}$, l, $\bar{l}$.

24

50. **tl.** tib., sans. KHy(a);
tc. tib., sans. khya. Төвөд, самгард хэлний нийлмэл (буюу уа зүүлтэт) khya гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

51. **tl.** tib., sans. Gl(a);
tc. tib., sans. gla. Төвөд, самгард хэлний нийлмэл (буюу la зүүлтэт) gla гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

52. **tl.** tib., sans. rK(a);
tc. tib., sans. rka. Төвөд, самгард хэлний нийлмэл (буюу га толгойт) rka гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

53. **tl.** tib., sans. sK(a);
tc. tib., sans. ska. Төвөд, самгард хэлний нийлмэл (буюу sa толгойт) ska гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

54. **tl.** tib., sans. lK(a);
tc. tib., sans. lka. Төвөд, самгард хэлний нийлмэл (буюу la толгойт) lka гийгүүлэгчийн бие даасан буюу (IF) хэлбэр.

Хэвтээ дөрвөлжин бичгийн уламжлалт цагаан толгойн эцэст, тоо болон дэс дарааны хувьд соёмбо бичгийнхитэй яг дүйх арван хоёр дэвсгэр гийгүүлэгчийг хэрхин тэмдэглэх аргыг жагсаан үзүүлсэн байдаг. Үүнд: тэдгээр гийгүүлэгч дэвсгэрлэхдээ соёмбо бичгийнхитэй адил "дүр урваж" жижигрэн зүүлт болж ордоггүй, бие даасан (IF) хэлбэрээрээ тэмдэглэгдэх боловч үе хаасны тэмдэг болох зураас буюу хэвтээ сүйхэлжин цэгийг доороо авдаг бөлгөө.

55. **tl.** mong.: AG, tib., sans.: AK;
tc. mong. ag, tib., sans.: ak (Жагсаалтын No. 10-тай харьцуулагтун).

56. **tl.** mong.: AK, tib., sans.: AKH;
tc. mong.: ak, tib., sans. akh (Жагсаалтын No. 11-тай харьцуулагтун).

57. **tl.** mong.: AN, tib., sans.: AN;
tc. mong.: an, tib., sans. an (Жагсаалтын No. 12-тай харьцуулагтун).

58. **tl.** mong.: AD, tib., sans.: AT;
tc. mong.: ad, tib., sans. at (Жагсаалтын No. 16-тай харьцуулагтун).

59. **tl.** mong., tib., sans. AN;
tc. mong., tib., sans. an (Жагсаалтын No. 18-тай харьцуулагтун).

60. **tl.** mong.: AG, tib., sans.: AK;
tc. mong. ag, tib., sans. ak (Жагсаалтын No. 19-тай харьцуулагтун).

61. **tl.** mong., tib., sans. AM;
tc. mong., tib., sans. am (Жагсаалтын No. 21-тай харьцуулагтун).

Figure 10: Description of Mongolian Square letters (from Shagdarsürüng 2001: 167).

62. **tl.** mong., tib., sans. AR;
tc. mong., tib., sans. ar (Жагсаалтын No. 23-тай харьцуулагтун).

63. **tl.** mong., tib., sans. AL;
tc. mong., tib., sans. al (Жагсаатын No. 24-тай харьцуулагтун).

64. **tl.** mong. AŠ, tib., sans.: AÇ / AŚ;
tc.mong. aš, tib., sans.: aç / aś (Жагсаалтын No. 26-тай харьцуулагтун).

65. **tl.** mong., tib., sans. AS;
tc. mong., tib., sans. as (Жагсаалтын No. 27-тай харьцуулагтун).

66. **tl.** mong. Aṉ;
tc. mong. aṉ. Үүнийг соёмбо бичигийн цагаан толгойн 41-рт дурдсан тайлбар сэлттэй харьцуулан үзнэ үү (ᠪᠠᠭ).

Хэвтээ дөрвөлжин бичигт Монгол, төвөд, самгард хэлнээ дэвсгэрлэж орсон гийгүүлэгчийг ийнхүү дор нь тусгайлан тэмдэглэдэг уламжлал Төв Азийн бусад үндэстний бичиг үсгийн тогтолцоонд ч харагддаг бөлгөө. Тухайлбал: солонгос бичигт гол төлөв харь үгийн дэвсгэр гийгүүлэгчийг иймэрхүү байдлаар тэмдэглэдэг тухай энэ номын зохиогчийн бичсэн зүйл буй[15].

Дээрхи жагсаалтаас үзэхүл, хэвтээ дөрвөлжин бичигийг төвөд үсэг болон түүнээ үндэслэн зохиосон монгол дөрвөлжин бичигт тулгуурлаж, тэр цагийнхаа номын гурван хэл болж байсан монгол, төвөд, самгард хэлний үгийг тэмдэглэхэд зориулан таацуулж зохиосон болох нь тодорхой харагдана.

Одоо энэ хир хэвтээ дөрвөлжин бичигээрхи дурсгалын зүйл гэвэл тоо ширхэгийн хувьд тийм ч цөөнгүй, хэмжээний хувьд харьцангуй янз бүр, зарим нь тамгын дардас төдий байхад зарим нь 7-8 хуудас ар өвөргүй байх жишээтэй. Хэлний хувьд, төвөд болон самгардаар бие даалган бичсэн буюу хадсан дурсгал харьцангуй илүү боловч сүүлийн үес монгол хэлээр буй дурсгал нэмэгдэн олдсоор буй бөгөөд эдгээр дурсгалуудыг цуглуулах, судлах, хэвлэн нийтлэхэд   Р. Бямбаа онцгой үүрэг гүйцэтгэснийг энэ ташрамд дурдалгүй орхих аргагүй.[16] Үүнээс гадна Р. Бямбаа номдоо соёмбо бичгийн тайлбар болгон тусгай ном зохиож байсан "Угалзын лам" хэмээн алдаршсан Лувсансодовжамцын *"Yig-bçad gsal ba'i me-long žes bya ba bzugs-so"* буюу *"Үсэгийн номлол тодорхой толь хэмээх оршивой"* гэдэг нэртэй бүтээлийг монгол орчуулгын хамт эрдэм шинжилгээний гүйлгээнд оруулсан нь хэвтээ дөрвөлжин бичгийн талаар энэ хир бидний үетэй золгосон цорын ганц уламжлалт тайлбар зохиол болж өгсөн ач холбогдолтой юм. Энэ номын мэдээнээс үзвэл нэлээд зүйл тодорхой болж өгнө. Тухайлбал:

1.6.:   (3)... Ранжүн Ишдоржбалсамбуу-бээр зохиосон үсгээс өөрөө аяндаа гарсан "Соёмбо" хэмээх үсэг нь их алдаршсан бөгөөд үсэг бусдыг зохиосон нь энэ богдын шавийн ахмад

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[15] Ц. Шагдарсүрэн, *Монгол солонгос бичиг үсгийн харилцаа холбооны асуудал*, - Mongolian Studies (The Korean Association for Mongol Studies), N. 4 (1996), Soeul, 1997, 169-192 х; Ts. Shagdarsurung, *A Study of Relation between the Korean and Mongolian Scripts*, The Research Paper to The Korea Foundation, Seoul, 1998, pp. 1-27.

[16] Р. Бямбаа, *Хэвтээ дөрвөлжин үсэг, түүний дурсгалууд*, Улаанбаатар, 1997, 90 х.

Figure 11: Description of Mongolian Square letters (from Shagdarsürüng 2001: 168).
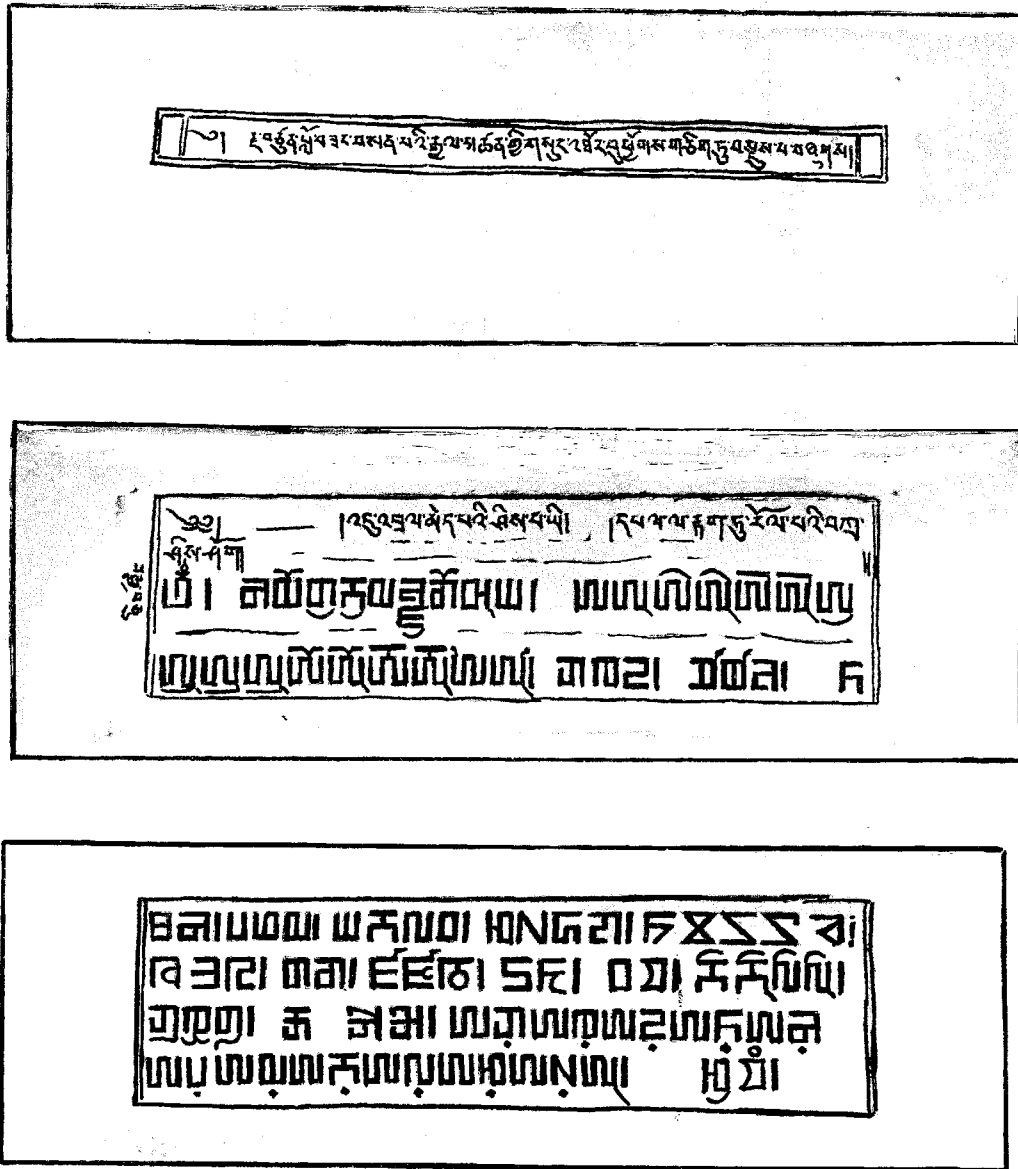
Figure 12: A record showing letters of Mongolian Square (from Shagdarsürüng 2001: 171).
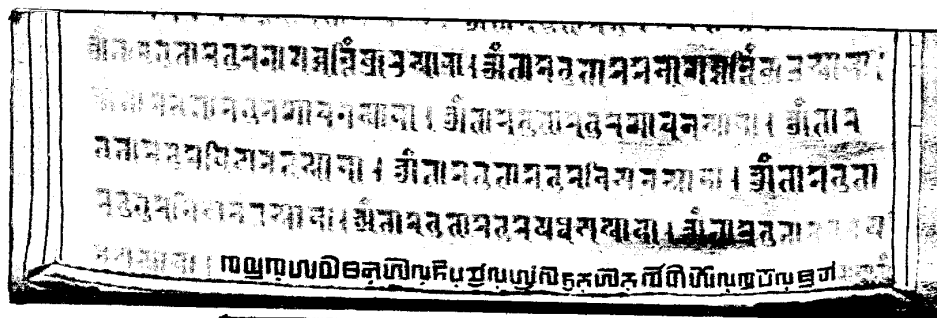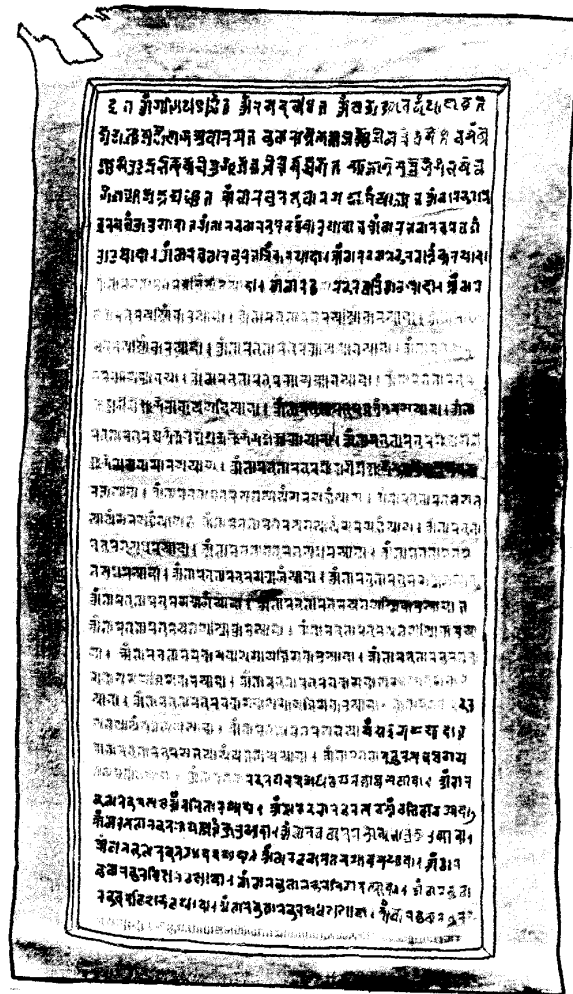
Figure 13: Mongolian Square text at the bottom of a record written in Ranjana (from Shagdarsürüng 2001: 172).
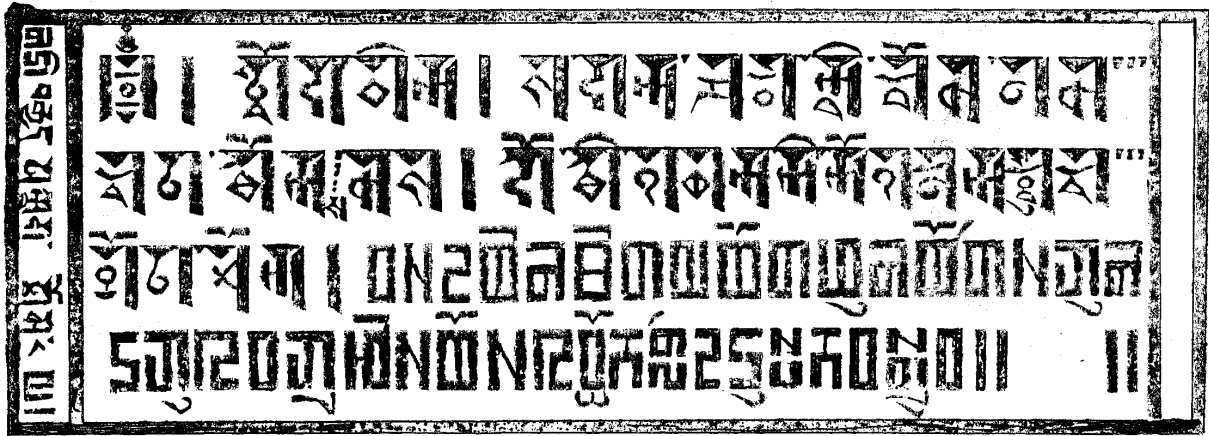
Figure 14: A manuscript containing text in Soyombo and Mongolian Square (from Shagdarsürüng 2001: 173). Note the sizing of consonant stacks, such that the letters are reduced so that the height of the stack matches the regular letter height.

Figure 15: Xylograph (block print) of a book cover with text in the Soyombo, Mongolian Square, Mongolian, and Cyrillic scripts (from Boldsaikhan, et al. 2005: 330). The title is Sanskrit written in Soyombo: *Mongal-svayaṃbhu-jyoti-varṇa-lipiḥ*. The Mongolian Square represents Tibetan, the Mongolian represents Mongolian, and the Cyrillic represents Modern (Khalkha) Mongolian. Notice the use of ꡛ FINAL VA in the word ꡛꡏꡠꡍ *svayambhu*.

Figure 16: A manuscript fragment containing text written in Ranjana, Soyombo, Mongolian Square, and Tibetan scripts (from Shagdarsürüng 2001: 174).
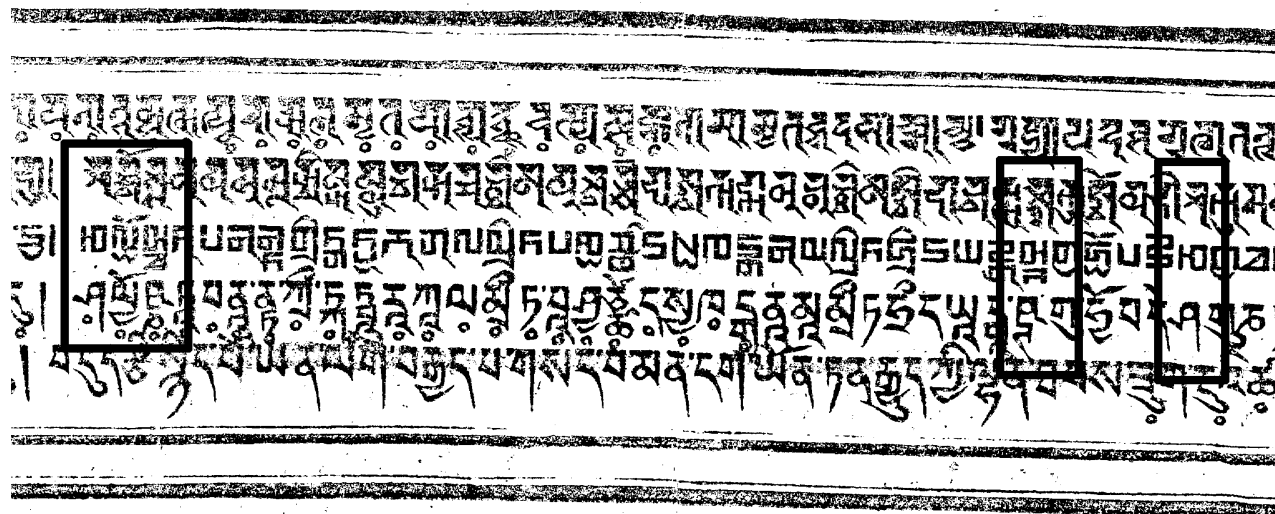
Figure 17: Detail of manuscript from figure 16 showing use of Ⴞ SHA and ᏅᎻ REVERSED SHA (adapted from Shagdarsürüng 2001: 174). The first instance of ᏅᎻ occurs in the cluster 𑨮 *ṣṇa*, corresponding to Soyombo 𑪈 and Tibetan ཥྞ. The second instance occurs in the cluster 𑨮 *ṣṭa* corresponding to Soyombo 𑪈 and Tibetan ཥྚ (note: in *ṣṭa* the /ṭ/ is represented using ꓞ, a reversed form of ꓝ DA (/d/, /t/), instead of ꓝ GALIG TTA (/ṭ/); the expected rendering of *ṣṭa* is 𑨮. The final instance shows ᏅᎻ REVERSED SHA independently. See section 4.5.2 for more information on the use of reversed letters in Mongolian Square.
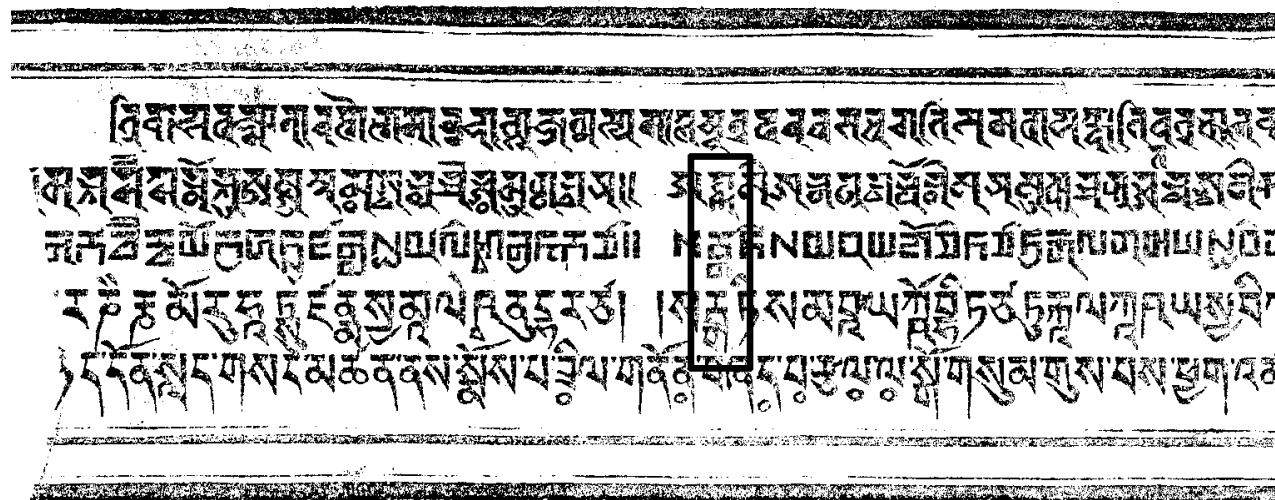
Figure 18: A manuscript fragment containing text written in Ranjana, Soyombo, Mongolian Square, and Tibetan scripts (adapted from Shagdarsürüng 2001: 156). Note the use of full-form ᚠ RA in cluster-initial position (instead of ᚐ LETTER INITIAL RA) in 𑨫 *rga*, corresponding to Tibetan རྒ.

Figure 19: Folios 1b (top) and 7a (bottom) of a manuscript of the biography of Zanabazar. Note the use of 卐, a reversed form of 卍 NA, instead of ꡋ GALIG NNA for writing the Sanskrit retroflex nasal /ŋ/ in the word 卐 *maṇi*. Images used with permission of Byambaa Ragchaa.

	Mongolian Square	Phags-pa Seal	Phags-pa Book	Soyombo	Tibetan
ga	ꡂ	巨	匼	ग	ग
ka	吅	曰	㕪	ग़	ᄀ
nga	⊐	∪	≡	ᄀ	ᄃ
ja	卫	⫫	目	ᄌ	ᄎ
ca	吅	田	禾	ᄍ	ᄎ
nya	曰	⫝	团	ᄧ	ᄒ
da	匚	冝	疟	ᄀ	ᄃ
ta	日	皿	冄	ᄀ	ᄇ
na	団	⊠	团	ᄀ	ᄒ
ba	凵	日	因	ᄀ	ᄇ
pa	吅	⊓	吅	ᄀ	ᄑ
ma	吅	⊠	因	ᄀ	ᄆ
ya	吅	∃	凵	ᄀ	ᄅ
ra	币	⊢	不	ᄀ	ᄌ
la	冂	⊐	匝	ᄀ	ᄅ
va	☐	—	—	ᄀ	ᄇ
sha	凵	団	凵	ᄌ	ᄉ
sa	И	Ϩ	ᄌ	ᄌ	ᄉ
ha	ᄀ	ᄉ	ᄌ	ᄀ	ᄒ

Table 1: Comparison of consonant letters of Mongolian Square, Phags-pa, and Tibetan.

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	Mongolian Square	Phags-pa Seal	Phags-pa Book	Soyombo	Tibetan
galig kssa	리	—	—		ཀྵ
galig tta	ᠮ	ᠮ	ᠮ		ཊ
galig ttha	ᠮ	ᠮ	ᠮ		ཋ
galig dda	ᠮ	ᠮ	ᠮ		ཌ
galig ddha	ᠮ	—	—		ཌྷ
galig nna	ᠮ	ᠮ	ᠮ		ཎ
galig zha	ᠮ	ᠮ	ᠮ		ཞ
galig za	ᠮ	ᠮ	ᠮ		ཟ
galig small a	ᠮ	ᠮ	ᠮ		འ
galig ga	ᠮ	ᠮ	ᠮ		ག
galig gha	ᠮ	—	—		གྷ
galig ja	ᠮ	ᠮ	ᠮ		ཇ
galig jha	ᠮ	—	—		ཛྷ
galig va	ᠮ	ᠮ	ᠮ		ཝ
galig da	ᠮ	ᠮ	ᠮ		ད
galig dha	ᠮ	—	—		དྷ
galig ba	ᠮ	ᠮ	ᠮ		བ
galig bha	ᠮ	—	—		བྷ
galig tsa	ᠮ	ᠮ	ᠮ		ཙ
galig tsha	ᠮ	ᠮ	ᠮ		ཚ
galig dza	ᠮ	ᠮ	ᠮ		ཛ
reversed sha	ᠮ	—	—		ཥ

Table 2: Comparison of consonant letters of Mongolian Square, Phags-pa, and Tibetan.

	Mongolian Square	Phags-pa Seal	Phags-pa Book	Soyombo	Tibetan
a	ꡭ	ꡘ	ꡖ		ꨀ
ā	ꡭ	—	—		◌
i	ꡭ	ꡞ	ꡞ		◌
ī	ꡭ	—	—		◌
e	ꡭ	ꡠ	ꡠ		◌
ē	ꡭ	—	—		◌
ü	ꡭ	—	—	—	
ṻ	ꡭ	—	—	—	
u	ꡭ	ꡟ	ꡟ		◌
ū	ꡭ	—	—		◌
o	ꡭ	K	ꡛ		◌
ō	ꡭ	—	—		◌
ö	ꡭ	—	—	—	
ȫ	ꡭ	—	—	—	
ai	ꡭ	—	—	—	
au	ꡭ	—	—	—	

Table 3: Comparison of consonant letters of Mongolian Square, Phags-pa, and Tibetan.

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**
See also http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Proposal to Encode the Mongolian Square Script in ISO/IEC 10646*
2. Requester's name: *Script Encoding Initiative (SEI) / Anshuman Pandey (pandey@umich.edu)*
3. Requester type (Member body/Liaison/Individual contribution): *Liaison contribution*
4. Submission date: *2013-10-27*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *Yes*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *Yes*
      Proposed name of script: *Mongolian Square*
   b. The proposal is for addition of character(s) to an existing block:
      Name of the existing block:
2. Number of characters in proposal: *67*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary   B.1-Specialized (small collection)   X   B.2-Specialized (large collection)
   C-Major extinct   D-Attested extinct   E-Minor extinct
   F-Archaic Hieroglyphic or Ideographic   G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? *Yes*
   a. If YES, are the names in accordance with the "character naming guidelines"
      in Annex L of P&P document? *Yes*
   b. Are the character shapes attached in a legible form suitable for review? *Yes*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
      Anshuman Pandey
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
      Anshuman Pandey (pandey@umich.edu)
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources)
      of proposed characters attached? *Yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input,
   presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *Yes*

8. Additional Information:
Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

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[1] Form number: N4102-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *No*
    If YES explain

2. Has contact been made to members of the user community (for example: National Body,
    user groups of the script or characters, other experts, etc.)? *Yes*
        If YES, with whom? *Specialists of Mongolian writing systems*
        If YES, available relevant documents:

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

4. The context of use for the proposed characters (type of use; common or rare) *Rare*
    Reference:

5. Are the proposed characters in current use by the user community? *Yes*
    If YES, where? Reference: *By scholars of Mongolian history and linguistics*

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely
    in the BMP? *N/A*
        If YES, is a rationale provided?
        If YES, reference:

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

8. Can any of the proposed characters be considered a presentation form of an existing
    character or character sequence? *No*
        If YES, is a rationale for its inclusion provided?
        If YES, reference:

9. Can any of the proposed characters be encoded using a composed character sequence of either
    existing characters or other proposed characters? *No*
        If YES, is a rationale for its inclusion provided?
        If YES, reference:

10. Can any of the proposed character(s) be considered to be similar (in appearance or function)
    to, or could be confused with, an existing character? *No*
        If YES, is a rationale for its inclusion provided?
        If YES, reference:

11. Does the proposal include use of combining characters and/or use of composite sequences? *Yes*
    If YES, is a rationale for such use provided? *Yes*
        If YES, reference: *Combining signs*
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
        If YES, reference:

12. Does the proposal contain characters with any special properties such as
    control function or similar semantics? *Yes*
        If YES, describe in detail (include attachment if necessary) *Subjoiner;*
        see text of the proposal

13. Does the proposal contain any Ideographic compatibility characters? *No*
    If YES, are the equivalent corresponding unified ideographic characters identified?
        If YES, reference: