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

Doc Type:	**Working Group Document**
Title:	**Preliminary Proposal to add the Ahom Script in the SMP of the UCS**
Source:	**Martin Hosken, Stephen Morey**
Action:	**For consideration by JTC1/SC2/WG2**
Date:	**2010-09-17**

1. Introduction: The Ahom script is used in North East India for the Tai Ahom language [AHO] and there are also some bilingual manuscripts from the 18th century that are partially in Assamese [ASM]. The Ahom Kingdom was set up (traditional date 1228) by a prince of Mau Long (now in the Dehong Dai prefecture of Yunnan province China). There are stone inscriptions in Yunnan very similar to Tai Ahom, and it is possible that the Ahoms brought their script from Mau Long when they arrived in Assam. The oldest surviving Ahom text, however, is the 'Snake Pillar' now in the State Museum of Assam, Guwahati, inscribed for King Siuw Hum Miung (1497-1539). In addition to this stone inscription and a few others, there are coins, brass plates and a large corpus of manuscripts. Until the early 19th century, manuscripts were written either on cloth, or more usually on the bark of the Sasi tree (Aquillaria Agallocha). Many thousands of such bark manuscripts have survived, often multiple copies of the same texts. Very few have been translated because knowledge of the language by the Ahom community is partial at best.

The Tai Ahom language went into decline from the late 17th century, and by 1800 was probably not spoken at all as mother tongue in Assam. However, the traditional priests, custodians of the manuscripts, kept up some religious practice throughout the 19th century and a revival of Ahom culture and language has been under way since at least 1920 (see Terwiel 1996 for a critique of this revival, also Morey 2002). Even before this, the revival of Ahom may be said to have begun in the late 18th century, with the compilation of two bilingual texts, the Bar Amra, an Ahom to Assamese lexicon, and the Loti Amra (see Barua and Phukon 1964, Tabassum and Morey 2010).

The modern period of use of the Ahom script commences with the publication of the Ahom-Assamese-English Dictionary (G. Barua 1920). Many dictionaries, word lists and primers have followed, first printed with a font style that was significantly different from the 18th century manuscripts. Since the 1997 development of an Ahom computer font (by Stephen Morey) the publication of Ahom texts has proceeded much more rapidly and there are now large numbers of books in Assam printed with at least some Ahom content.

2. Structure: Ahom is of the Brahmic type with an inherent vowel, medial consonants clustered with the initial consonant and a visible virama killer character, which has only become obligatory in modern Ahom. Ahom has no independent vowels, instead they are represented by AHOM LETTER A (U+112D2) followed by the corresponding dependent vowel sign. Dependent vowel signs are stored following the initial consonant cluster.

There are various irregular vowel sequences used in archaic Ahom, for example ꥲꥦ AHOM LETTER NA (U+112C3) AHOM VOWEL SIGN O (U+112E8) AHOM VOWEL SIGN AW (U+112E5) AHOM LETTER BA (U+112D0) AHOM SIGN VIRAMA (U+112EB) AHOM VOWEL SIGN U (U+112EA) `star`[1].

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1   The 112EA in this spelling is what makes it irregular.

Ahom uses the repeating of the final vowel, vowel sequence or consonant plus virama, as a way of indicating that the word should be reduplicated. Vowels that may be so repeated are: AHOM VOWEL SIGN AA (U+112E1), AHOM VOWEL SIGN II (U+112E2), AHOM VOWEL SIGN AW (U+112E5), AHOM VOWEL SIGN AI (U+112E6), AHOM VOWEL SIGN AM (U+112E7), AHOM SIGN VIRAMA (U+112EB), and the sequence AHOM LETTER BA (U+112D0) AHOM SIGN VIRAMA (U+112EB).

3. Digits: Knowledge of Ahom digits is incomplete with Ahom specific shapes only being known for 1, 7 8 and 10. Some other digit shapes are borrowed and then localised, from Burmese: 6 and 9 and the remaining digits: 2, 3 4 and 20 are merely the words for those numbers in Ahom spelled out. Lack of knowledge of digits is exacerbated by the common mixing of digits between systems (particularly with Burmese digits) in a number. A specific digit block has been included because some modern manuscripts do use specifically Ahom numbers. Full details of what should be used specifically for 2, 3 and 4 are an open issue.

In manuscript usage of Ahom, the digit 20 does get used as a digit. Numbers above 100 are typically fully spelled out as words since they occur within text. In manuscript usage numbers above 10 tend only to be used for page numbers, and no 100 page books have been found yet. The following is an example of a page number:

꘲ (AHOM DIGIT 2 U+112F2) ꘻ (AHOM DIGIT 20 U+112FB) ꘺ (AHOM DIGIT 10 U+112FA) ꘸ (AHOM DIGIT 8 U+112F8) meaning '58'.

4. Punctuation: There are three punctuation marks. The two dandas are local to this script and not shared from any other script block. The AHOM SIGN RULAI is used as a paragraph mark.

5. Word spacing: Modern Ahom and some manuscripts have word spaces. Other manuscripts have no word spaces.

6. Variant Forms: Ahom has a number of variant and ligature glyphs that are worthy of attention.

This is a contextual ligature of AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN U (U+112EA). It is only used if there is no ambiguity that closing the right hand side of the initial consonant will make it look like another consonant. For example, one would not render AHOM LETTER NGA (U+112C2) AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN U (U+112EA) using this ligature (ꦥ) because it would look too much like AHOM LETTER MA (U+112C8) AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN U (U+112EA) (ꦥ) which can safely use this ligature.
These consonants may not take the ligature: ꋂ AHOM LETTER NGA (U+112C2) ꋃ AHOM LETTER NA (U+112C3) ꋇ AHOM LETTER DA (U+112C7) ꋎ AHOM LETTER NYA (U+112CE)

This is a ligature of AHOM VOWEL SIGN O (U+112E8) AHOM VOWEL SIGN A (U+112E1). It is believed to convey the glide-vowel combination /wa/, as ꦥ AHOM LETTER KA (U+112C0) AHOM VOWEL SIGN O (U+112E8) AHOM VOWEL SIGN AA (U+112E1) AHOM LETTER NGA (U+112C2) AHOM SIGN VIRAMA (U+112EB), pronounced /kwaang/.

This is a font variant of AHOM LETTER JHA (U+112D5) in the form found in older manuscripts. The main form AHOM LETTER JHA (U+112D5) was that adopted for use at the beginning of the Ahom revival in the 1920s.

In manuscript Ahom there are a number of variations, not found in modern Ahom, that are being analysed. The following is a discussion of such variations. Some of that discussion is based around the use of a variation selector VARIATION SELECTOR-1 U+FE00. This selector may occur following only an AHOM LETTER or AHOM VOWEL SIGN. The variation selector has been preferred over separate encoding to facilitate analysis in order ascertain which should be encoded as separate characters and which are merely glyph variants. No such variation occurs in modern Ahom.

ꨑ This is a ligature of AHOM LETTER KHA (U+112C1) + AHOM MEDIAL RA (U+112DF). This requires further research as to whether a more conventional rendering of this sequence occurs.

ꨖ This is a ligature of AHOM LETTER PHA (U+112C9) + AHOM MEDIAL RA (U+112DF). This requires further research as to whether a more conventional rendering of this sequence occurs.

ꩥ This is a font variant of AHOM LETTER GA (U+112C0) but it may also occur along with AHOM LETTER GA (U+112C0) in some rare manuscripts. A variation selector may be used where both need to be separated for analysis purposes, in which case the default form is used and this form is the variation form.

ꯎ This is a font variant of AHOM LETTER GA (U+112C0) and does not occur in documents involving the other variant listed above.

ꨓꨆ This ligature is actually two characters AHOM LETTER TA (U+112C5) AHOM LETTER JA (U+112CD) conjoined. But the TA has been shortened. This is an example of where a variation of TA is used. Thus this sequence would be stored AHOM LETTER TA (U+112C5) VARIATION SELECTOR-1 (U+FE00) AHOM LETTER JA (U+112CD).

The sequence AHOM VOWEL SIGN AW (U+112E5) AHOM VOWEL SIGN AM (U+112E7) often ligates such that the AHOM VOWEL SIGN AM (U+112E7) renders before the AHOM VOWEL SIGN AW (U+112E5). This may also occur rarely with the sequences AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN AM (U+112E7). In addition the sequence AHOM SIGN VIRAMA (U+112EB) AHOM VOWEL SIGN AW (U+112E5) often ligates.

7. Character Naming: Character names follow the phonetics of the characters. AHOM LETTER JA (U+112C9) acts like a YA but is pronounced in modern Ahom as JA. Likewise AHOM LETTER BA (U+112D0) acts like a WA but is pronounced in modern Ahom as BA.

8. Sort order: A standard sort order for Ahom has not been agreed. There are various in existence. Sorting Ahom gives higher priority to the final consonant than to the vowel. In fact, early sorting gave higher priority to the final consonant than to the initial consonant! But nobody is recommending this for a modern sorting. For DUCET the ordering is not expected to give precedence to the final consonant, although it would be expected for language specific tailoring(s).

Initial Consonant: Two orders exist. The most common ordering and the most likely to be used in modern primers, given in Barua (1920), is:

(a)	k	kh	ng	n	t	p	ph	b	m	j	ch	th	r	l	s	ny	h	d

and the most authoritative, given in Bar Amra as analysed by Stephen Morey, is:

k	kh	ng	n	ch	t	p	d	m	ph	th	s	r	j	ny	l	b	h	(a)

Final Consonants: Again there are two established orders for these and they differ from the orders for initial consonants. So in addition to these two orders, there is the option of unifying the final consonant order with one of the initial consonant orders. The most authoritative order, from Bar Amra, is:

-k	-ng	-n	-p	-m	-ny	-t	-w(b)

and the most common, from Barua and Phukan is:

-b(w)	-k	-ng	-n	-t	-p

Vowels: Vowels fall into two sequences: open and closed syllables. The open vowel sequence is (shown with an initial k):

ka	ka	ki	ku	ke	kai	ko	kav	kam	kum	kom

Then follows the closed syllables, here shown with initial and final k:

kak	kik	kuk	kok	kvk

Finally there are two extra open syllables:

kv	koi

9. Issues: Here we list the issues that need to be resolved before this proposal may be considered final.

1. *Unify U+112DE and U+112DF*: Are these two characters really different? They don't seem to appear in the same document. Is one code sufficient. This requires further manuscript research.

2. *Digits*: What are the appropriate digits for Ahom. The current digits for 2, 3, 4 and 20 are confusable with the corresponding words (being identical with them).

3. *Chart Font*: The font used for the chart has a manuscript style to it and is preferred by some scholars. It is also a little more developed. Is this the best font?

4. *Sort Order*: What is the primary sort order, or at least the subsortings of consonants and vowels.

5. *Variation Selectors*: Variation selectors are a poor way of encoding. All variation selection sequences need to be analysed to see if there is some other way of modelling them.

	112C	112D	112E	112F
0	ᴍ	ᴠ	◌<	ο
1	ᴠ	ᴎ	◌ʅ	᷆
2	ᴇ	ᴨ	◌̊	ᴠ
3	ᴇ	◠	◌̣	ᴡ̊
4	ᴠ	ʒ	√◌	ᴡ̊
5	ᴛ	ᴡ	◌ʃ	ᴨ
6	ᴜ	ᴘ	◌	ᴇ
7	ᴦ	ᴘ	◌̊	ᴔ
8	ᴀ	▓	◌̥	ᴔ
9	ᴠ	▓	◌̥	ᴐ
A	ᴠ	▓	◌̣	ᴑᴑ
B	ᴡ	▓	◌́	ᴡ
C	ᴃ	▓	▓	ᴵ
D	ᴡ	▓	▓	ᴵᴵ
E	ᴃ	◌̣	▓	ᴓ
F	ᴠ	ᴄ◌	▓	▓

Consonants

112C0	ᬀ	AHOM LETTER KA
112C1	ᬁ	AHOM LETTER KHA
112C2	ᬂ	AHOM LETTER NGA
112C3	ᬃ	AHOM LETTER NA
112C4	ᬄ	AHOM LETTER CHA
112C5	ᬅ	AHOM LETTER TA
112C6	ᬆ	AHOM LETTER PA
112C7	ᬇ	AHOM LETTER DA
112C8	ᬈ	AHOM LETTER MA
112C9	ᬉ	AHOM LETTER PHA
112CA	ᬊ	AHOM LETTER THA
112CB	ᬋ	AHOM LETTER SA
112CC	ᬌ	AHOM LETTER RA
112CD	ᬍ	AHOM LETTER JA
112CE	ᬎ	AHOM LETTER NYA
112CF	ᬏ	AHOM LETTER LA
112D0	ᬐ	AHOM LETTER BA
112D1	ᬑ	AHOM LETTER HA
112D2	ᬒ	AHOM LETTER A
112D3	ᬓ	AHOM LETTER GA
112D4	ᬔ	AHOM LETTER GHA
112D5	ᬕ	AHOM LETTER JHA
112D6	ᬖ	AHOM LETTER DHA
112D7	ᬗ	AHOM LETTER BHA

Medials

112DE	◌	AHOM CONSONANT SIGN MEDIAL LA
112DF	◌	AHOM CONSONANT SIGN MEDIAL RA

Vowels

112E0	◌	AHOM VOWEL SIGN A
112E1	◌	AHOM VOWEL SIGN AA
112E2	◌	AHOM VOWEL SIGN II
112E3	◌	AHOM VOWEL SIGN UU
112E4	◌	AHOM VOWEL SIGN E
112E5	◌	AHOM VOWEL SIGN AW
112E6	◌	AHOM VOWEL SIGN AI
112E7	◌	AHOM VOWEL SIGN AM
112E8	◌	AHOM VOWEL SIGN O
112E9	◌	AHOM VOWEL SIGN I
112EA	◌	AHOM VOWEL SIGN U
112EB	◌	AHOM SIGN VIRAMA

Digits

112F0	ᯀ	AHOM DIGIT 0
112F1	ᯁ	AHOM DIGIT 1
112F2	ᯂ	AHOM DIGIT 2
112F3	ᯃ	AHOM DIGIT 3
112F4	ᯄ	AHOM DIGIT 4
112F5	ᯅ	AHOM DIGIT 5
112F6	ᯆ	AHOM DIGIT 6
112F7	ᯇ	AHOM DIGIT 7
112F8	ᯈ	AHOM DIGIT 8
112F9	ᯉ	AHOM DIGIT 9
112FA	ᯊ	AHOM DIGIT 10
112FB	ᯋ	AHOM DIGIT 20

Punctuation

112FC	ᯌ	AHOM SIGN SMALL SECTION
112FD	ᯍ	AHOM SIGN SECTION
112FE	ᯎ	AHOM SIGN RULAI

Unicode Properties

```
112C0;AHOM LETTER KA;Lo;0;L;;;;;N;;;;;
112C1;AHOM LETTER KHA;Lo;0;L;;;;;N;;;;;
112C2;AHOM LETTER NGA;Lo;0;L;;;;;N;;;;;
112C3;AHOM LETTER NA;Lo;0;L;;;;;N;;;;;
112C4;AHOM LETTER CHA;Lo;0;L;;;;;N;;;;;
112C5;AHOM LETTER TA;Lo;0;L;;;;;N;;;;;
112C6;AHOM LETTER PA;Lo;0;L;;;;;N;;;;;
112C7;AHOM LETTER DA;Lo;0;L;;;;;N;;;;;
112C8;AHOM LETTER MA;Lo;0;L;;;;;N;;;;;
112C9;AHOM LETTER PHA;Lo;0;L;;;;;N;;;;;
112CA;AHOM LETTER THA;Lo;0;L;;;;;N;;;;;
112CB;AHOM LETTER SA;Lo;0;L;;;;;N;;;;;
112CC;AHOM LETTER RA;Lo;0;L;;;;;N;;;;;
112CD;AHOM LETTER YA;Lo;0;L;;;;;N;;;;;
112CE;AHOM LETTER NYA;Lo;0;L;;;;;N;;;;;
112CF;AHOM LETTER LA;Lo;0;L;;;;;N;;;;;
112D0;AHOM LETTER BA;Lo;0;L;;;;;N;;;;;
112D1;AHOM LETTER HA;Lo;0;L;;;;;N;;;;;
112D2;AHOM LETTER A;Lo;0;L;;;;;N;;;;;
112D3;AHOM LETTER GA;Lo;0;L;;;;;N;;;;;
112D4;AHOM LETTER GHA;Lo;0;L;;;;;N;;;;;
112D5;AHOM LETTER JHA;Lo;0;L;;;;;N;;;;;
112D6;AHOM LETTER DHA;Lo;0;L;;;;;N;;;;;
112D7;AHOM LETTER BHA;Lo;0;L;;;;;N;;;;;

112DE;AHOM CONSONANT SIGN MEDIAL LA;Mn;0;NSM;;;;;N;;;;;
112DF;AHOM CONSONANT SIGN MEDIAL RA;Mn;0;NSM;;;;;N;;;;;

112E0;AHOM VOWEL SIGN A;Lo;0;L;;;;;N;;;;;
112E1;AHOM VOWEL SIGN AA;Lo;0;L;;;;;N;;;;;
112E2;AHOM VOWEL SIGN II;Mn;0;NSM;;;;;N;;;;;
112E3;AHOM VOWEL SIGN UU;Mn;0;NSM;;;;;N;;;;;
112E4;AHOM VOWEL SIGN E;Mc;0;L;;;;;N;;;;;
112E5;AHOM VOWEL SIGN AW;Mn;0;NSM;;;;;N;;;;;
112E6;AHOM VOWEL SIGN AI;Mn;0;NSM;;;;;N;;;;;
112E7;AHOM VOWEL SIGN AM;Mn;0;NSM;;;;;N;;;;;
112E8;AHOM VOWEL SIGN O;Mn;0;NSM;;;;N;;;;;
112E9;AHOM VOWEL SIGN I;Mn;0;NSM;;;;N;;;;;
112EA;AHOM VOWEL SIGN U;Mn;0;NSM;;;;N;;;;;
112EB;AHOM SIGN VIRAMA;Mn;0;NSM;;;;;N;;;;;

112F0;AHOM DIGIT 0;Nd;0;L;;0;0;0;N;;;;;
112F1;AHOM DIGIT 1;Nd;0;L;;1;1;1;N;;;;;
112F2;AHOM DIGIT 2;Nd;0;L;;2;2;2;N;;;;;
112F3;AHOM DIGIT 3;Nd;0;L;;3;3;3;N;;;;;
112F4;AHOM DIGIT 4;Nd;0;L;;4;4;4;N;;;;;
112F5;AHOM DIGIT 5;Nd;0;L;;5;5;5;N;;;;;
112F6;AHOM DIGIT 6;Nd;0;L;;6;6;6;N;;;;;
112F7;AHOM DIGIT 7;Nd;0;L;;7;7;7;N;;;;;
112F8;AHOM DIGIT 8;Nd;0;L;;8;8;8;N;;;;;
112F9;AHOM DIGIT 9;Nd;0;L;;9;9;9;N;;;;;
112FA;AHOM DIGIT 10;Nd;0;L;;10;10;10;N;;;;;
112FB;AHOM DIGIT 20;Nd;0;L;;20;20;20;N;;;;;
112FC;AHOM SIGN SMALL SECTION;Po;0;L;;;;;N;;;;;
112FD;AHOM SIGN SECTION;Po;0;L;;;;;N;;;;;
112FE;AHOM SIGN RULAI;Po;0;L;;;;;N;;;;;
```
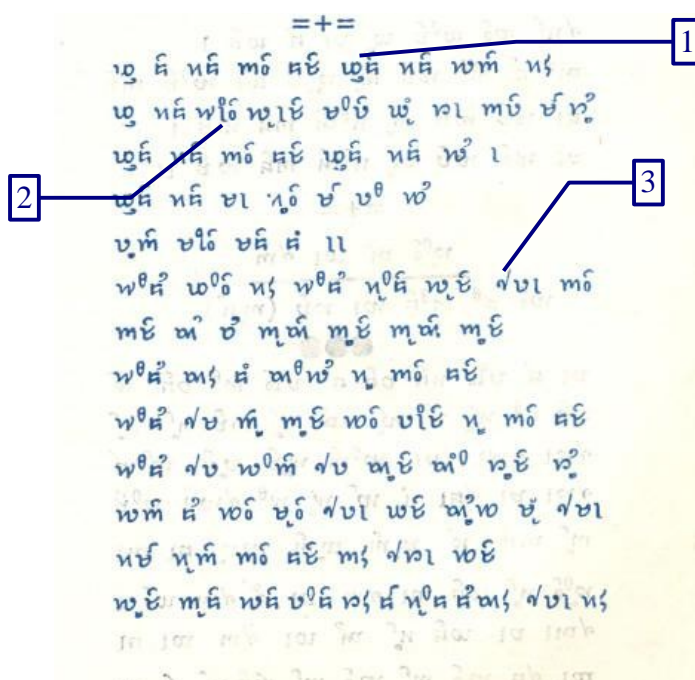
Examples

Figure 1: Lik Tai Khwam Tai page 7

This modern text was printed before the advent of computer fonts.

1. Sample of AHOM CONSONANT SIGN MEDIAL LA (U+112DE).

2. AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN U (U+112EA) ligature.

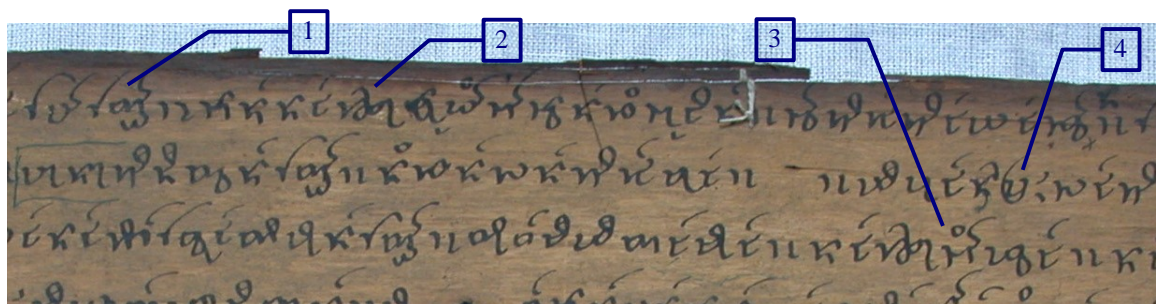3. Alternate, modern glyph, for AHOM VOWEL SIGN E (U+112E4).

Figure 2: NemiMang p2v

1. This shows an example of a typographical insertion. The BA is to be inserted after the TA it is written below. This relation does not need to be encoded in plain text.

2. An example of a variant form of PHA, attached to the KHA, which would be encoded using VARIATION SELECTOR-1. Notice here that it is the second consonant that is modified (the PHA).

3. Example of AHOM VOWEL SIGN AW (U+112E5) AHOM VOWEL SIGN AM (U+112E9) ligature

4. Example of AHOM CONSONANT SIGN MEDIAL RA (U+112DF)
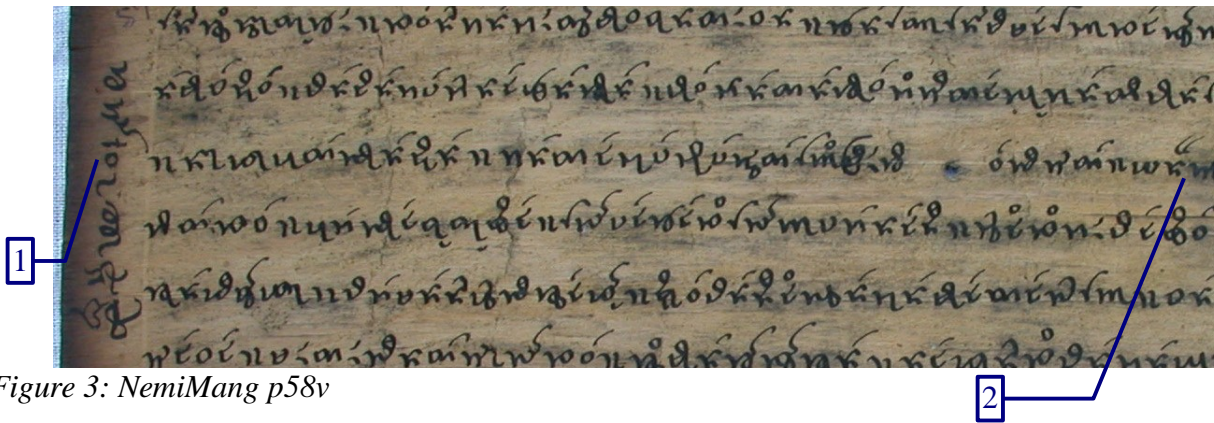
Figure 3: NemiMang p58v

1. '58' in Ahom and also in Burmese script

2. Example of reduplication through repeated AHOM SIGN VIRAMA (U+112EB)
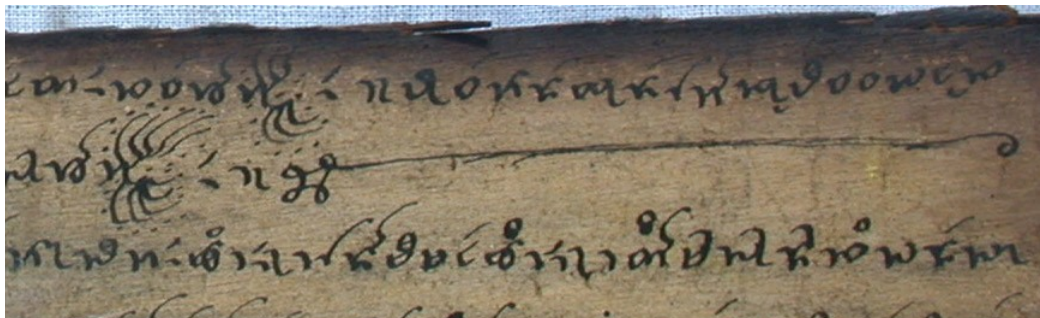
Figure 3: NemiMang p66r showing text final embellishment, perhaps a character akin to TAI THAM SIGN KEOW (U+1AA3). Notice the highly embellished /vi/ AHOM LETTER A (U+112D2) AHOM VOWEL SIGN I (U+112E9) AHOM VOWEL SIGN U (U+112EA) AHOM LETTER NYA (U+112CE) AHOM SIGN VIRAMA (U+112EB).
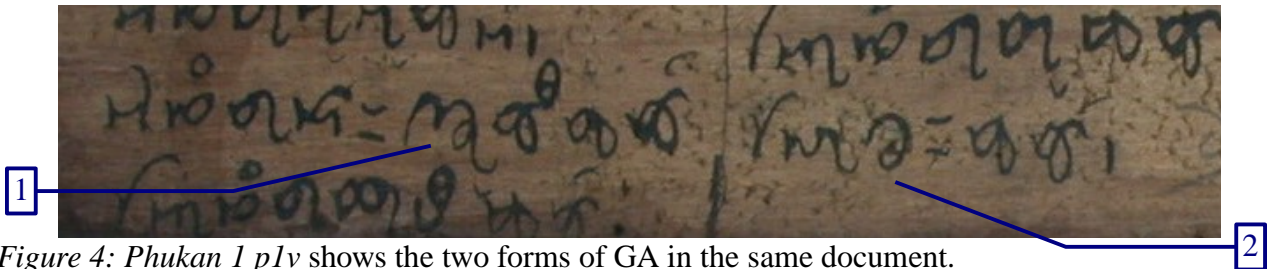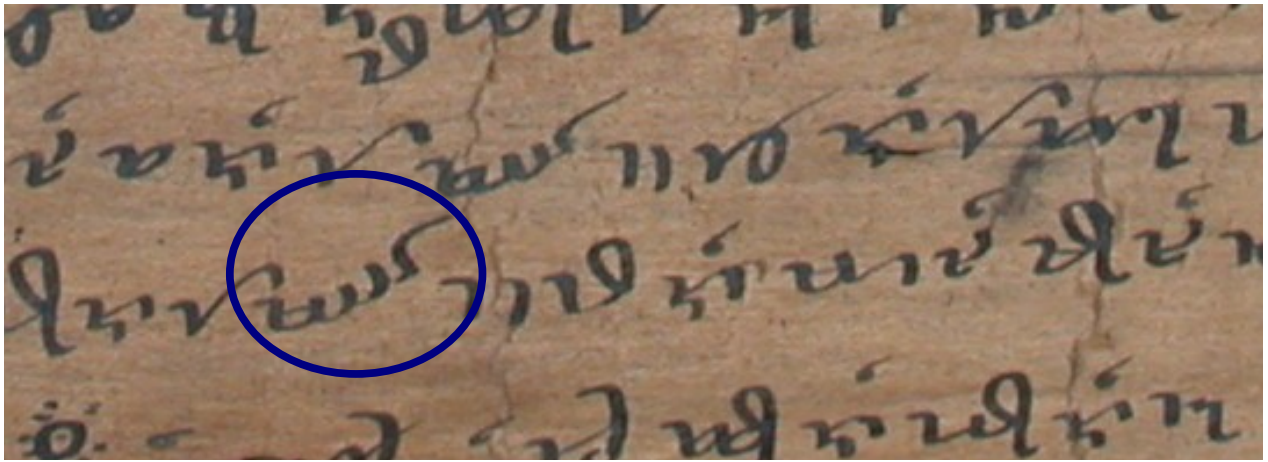

Figure 4: Phukan 1 p1v shows the two forms of GA in the same document.

Figure 5: Mohan 9 p2r showing AHOM LETTER TA (U+112C5) VARIATION SELECTOR-1 (U+FE00) AHOM LETTER JA (U+112CD) AHOM VOWEL SIGN AW (U+112E5)

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Acknowledgements

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[2]
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:**	*Ahom*
2. Requester's name:	*Martin Hosken*
3. Requester type (Member body/Liaison/Individual contribution):	*Individual contribution*
4. Submission date:	*08/09/10*
5. Requester's reference (if applicable):	
6. Choose one of the following:	
This is a complete proposal:	*X*
(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):   *X*
        Proposed name of script: *Ahom*
    b. The proposal is for addition of character(s) to an existing block:
        Name of the existing block:

2. Number of characters in proposal: *53*

3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary	B.1-Specialized (small collection)	B.2-Specialized (large collection)
C-Major extinct	D-Attested extinct X	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. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for
    publishing the standard?   *Stephen Morey*
    If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools
    used:

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)?   *no*

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 http://www.unicode.org/Public/UNIDATA/UCD.html 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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2 Form number: N3102-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)

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?   *Stephen Morey*

         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: *this document*

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

     Reference:

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

     If YES, where? Reference:

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

     in the BMP?   *no*

         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 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: *this document*

     Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?   *no*

         If YES, reference:

12. Does the proposal contain characters with any special properties such as

     control function or similar semantics?   *no*

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

13. Does the proposal contain any Ideographic compatibility character(s)?   *no*

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

         If YES, reference: