

**Title:** Brief Summary of the Discussion about Shape-Based Separation of Siddham Vowel Sign U/UU  
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## 1. Abstract

Andrew Glass (for detail, see L2/14-062) concerned that; there are several semantic distinctions of the vowel sign variants, but the separated encoding of the vowel sign variants (sharing same phonetic value but different shapes) may induce the wrong combination of the base consonant character and the inappropriate vowel sign.

I collected the representative glyph shapes for the syllables including U and UU. As a result, each tutorial material has its own preference about the combination, but it is known that there is almost no wrong combination.

Considering the result, Andrew proposed to encode the vowel sign variants at separated codepoints, and each code point defines the shape concretely.

This document combines the materials discussed before the Andrew's proposal.

## 2. Non-Mandara Evidences of Co-Usage of Vowel Sign U/UU Variants

In previous Siddham ad-Hoc at Tokyo, a critic against the proposal to encode the vowel sign variants was that the examples (for detail, see WG2 N4407R) taken from Mandara would be insufficient to rationalize the encoding of the vowel sign variants as combining character. For additional evidences, Japanese Siddham experts collected non-Mandara materials that co-usages of the vowel variants are found.

### 2.1 Co-Usage of Vowel Sign U Variants

Figure 1 and Figure 2 are submitted in L2/14-055. For the detailed analysis of their semantics are described in L2/14-055.

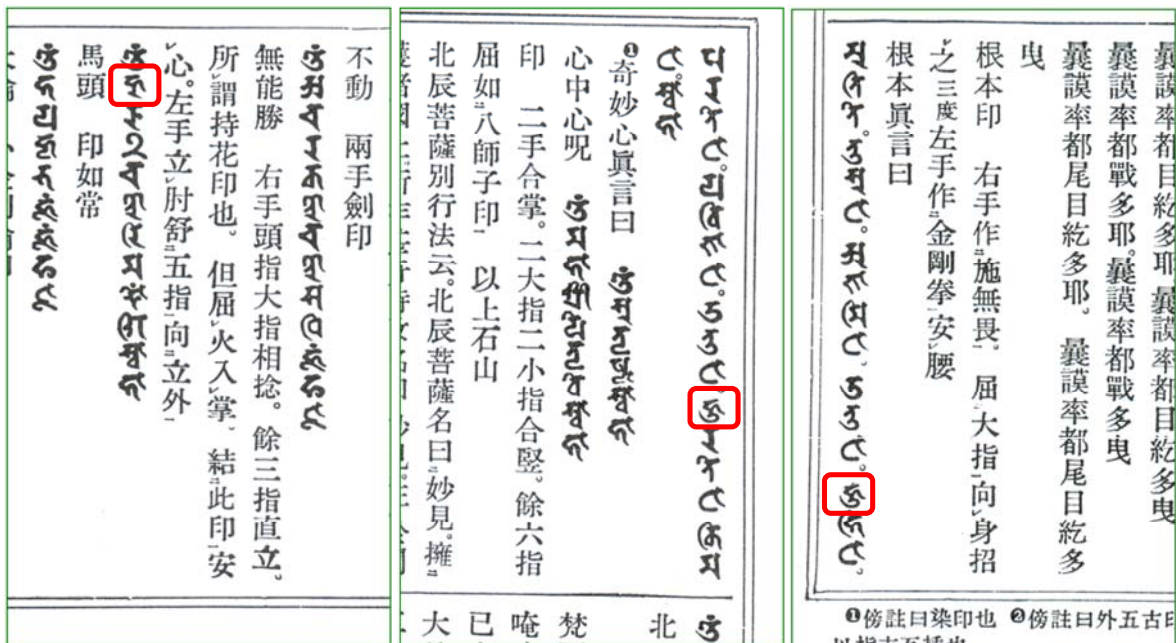


Figure 1: Differentiation of Vowel Sign U in the Mantra for Bhaisajyaguru (藥師如來), Usuzoushi, Taisho Vol. 78, Text No. 2495, p. 655 (left) and p.680-681 (mid-right).

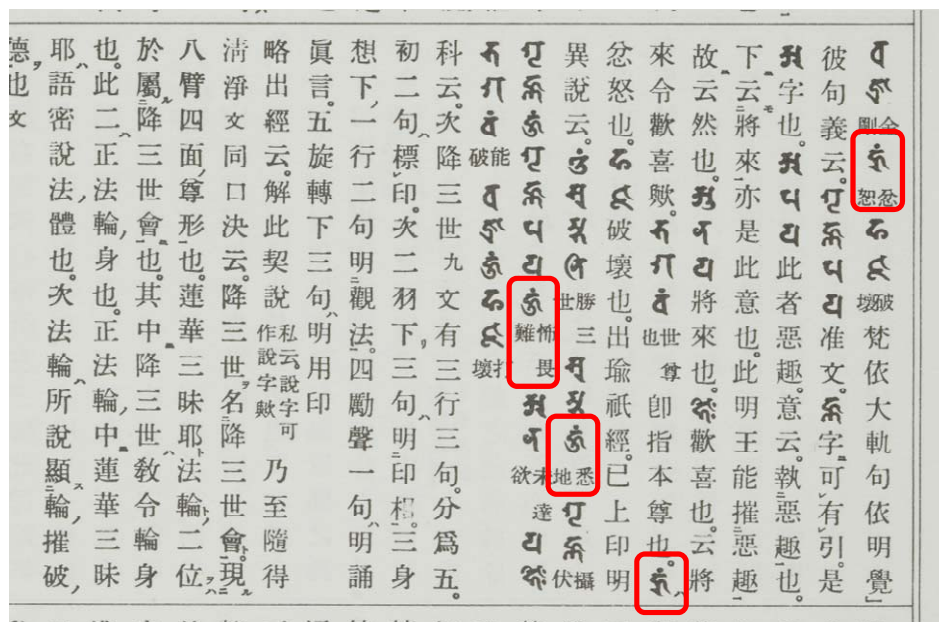


Figure 2: Another Semantic Differentiation of Vowel Sign U in Single Document Byakuhoushou (by Chouen, 13C), Taisho Vol. 96 (Zuzoubu Vol. 10), p. 313

## 2.2 Co-Usage of Vowel Sign UU Variants

Figure 3 and Figure 4 are submitted in L2/14-055. For the detailed analysis of their semantics are described in L2/14-055.

口傳云。此五尊五智之種子也。五佛種子也。三形又可用五佛。已觀五佛。豈三十七尊不具足哉。以三十七尊用諸尊段也。保元二年正月八日奉傳之。智海已上。文云。口云。我字佛部。左。我字金剛部。右。我字蓮花部。種子。此三字變成甘露瓶。是金剛部之內。猶表有三部也。故以三字種子也。已上。五云。我。二摩。三古智劍。我。大師。我。二賢瓶劍棒已上。三形事。三部云。口決云。東。我。成輪上五古。即成降三世。南。我。成輪上三股。即成軍荼利。西方。我。成輪上一獨。成大威德。北方。我。成輪上羯磨。成金剛藥叉。又云。輪上劍不五。胎上劍降三。胎上劍軍獨。胎上劍大羯磨上劍已金上。

Figure 3: Differentiation of Vowel Sign UU in Single Document

Byakuhoushou (by Chouen, 13C), Taisho Vol. 96 (Zuzoubu Vol. 10), Byakuhoushou, p. 999

淨一體之旨也。問。別御次第用。我字相違如何。答。准御口意。重。我字示金薩大日不二義歟。二尊同以。我字為種子。故依之祕藏記云。大日經。我字為金薩種子。金剛頂經。我字為大日種子。取意。御自筆。理趣經。奧五祕密段。種子用。我事。此經有兩段。初五尊各別也。是因也。因未冥會。各別位也。故初段用。我。又各別蓮月也。後五尊果位也。

內相祕三前五前大道

Figure 4: Another Differentiation of Vowel Sign UU in Single Document

Usuzoushi-Kuketsu (by Raiyu, 13-14C), Taisho Vol. 79, Text No. 2535, p. 234

### 2.3 Additional Co-Usage Evidences

The evidences with clearly deciphered semantics are hu, huu, hum and hum. Nagasaki collected more evidences for other consonants (yu, bu, puu), although their semantics are not fully deciphered yet.

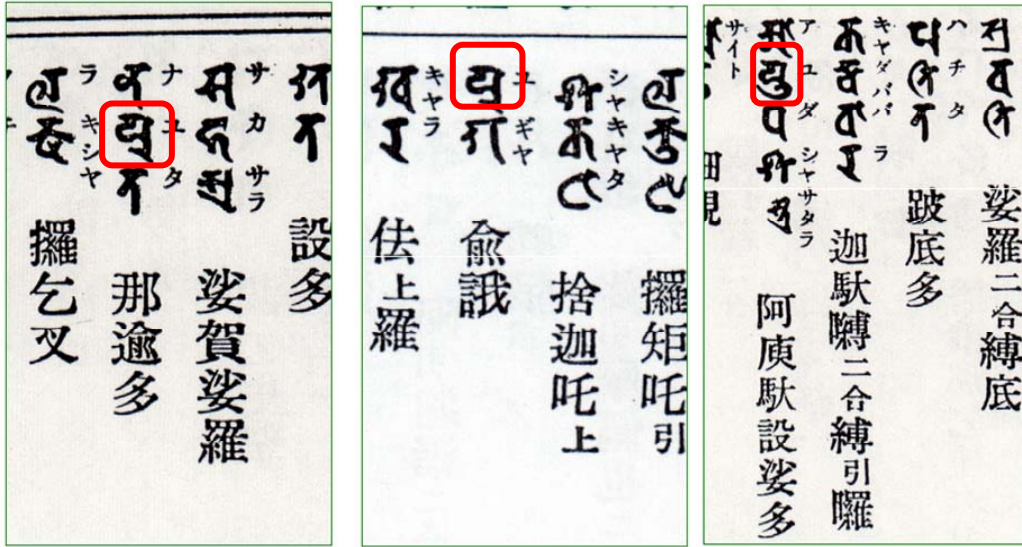


Figure 5: Differentiation of YU Syllable in Single Document

Bongo-Senjimon, Taisho Vol. 54, Text No. 2133B, p. 1214 (left), 1205 (mid) , 1202 (right).

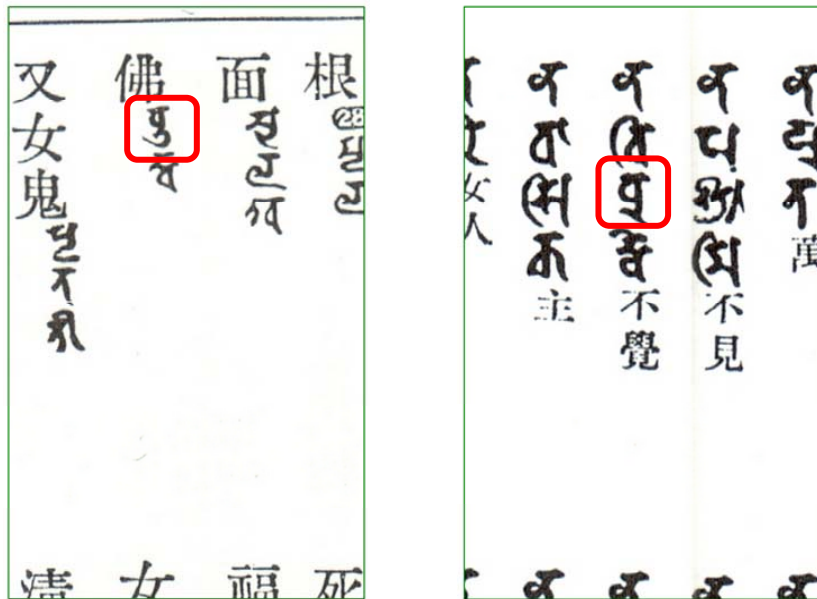


Figure 6: Differentiation of BU Syllable in Single Document

Tarayouki, Taisho Vol. 84, Text No. 2707, p. 582 (left), 599 (right).

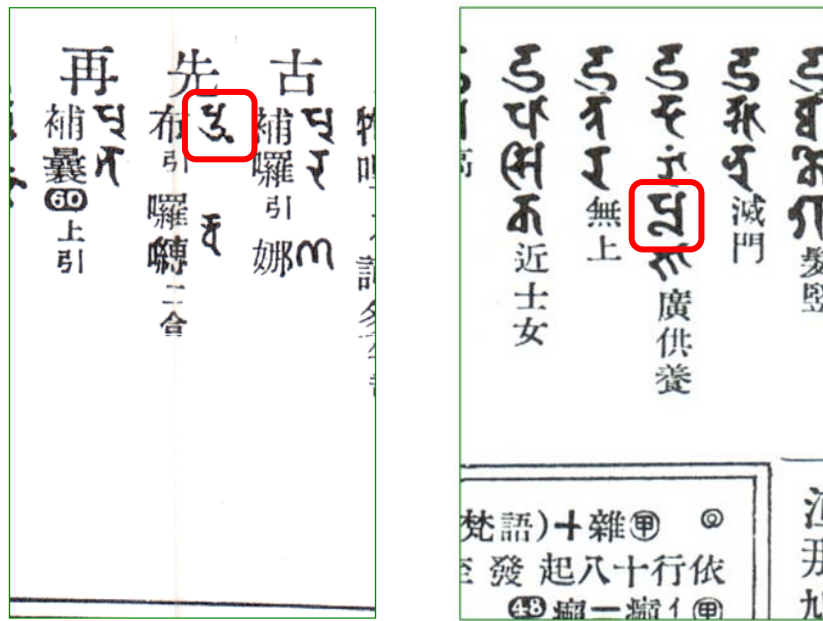


Figure 7: Differentiation of PUU Syllable in Single Document  
 Tarayouki, Taisho Vol. 84, Text No. 2707, p. 581 (left), 603 (right).

北斗種子曼荼羅 (種子=兒玉義隆筆、  
 作図=中村佳睦筆。大阪・真龍寺藏)

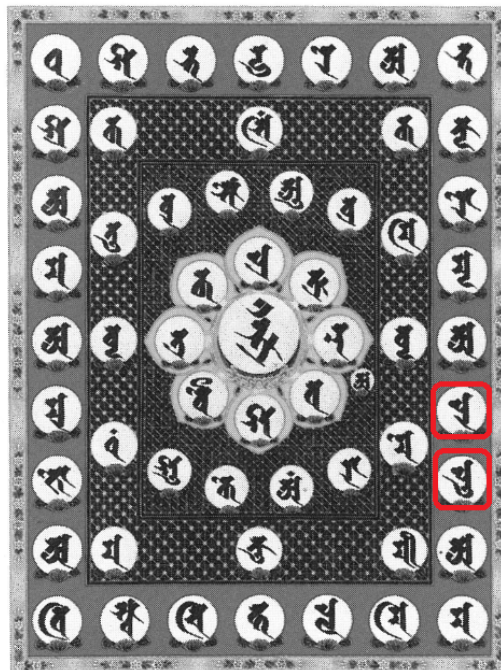


Figure 8: A method of practice named Big Dipper-method. It adopts two types of pu to distinguish between Punarvasuu and Pus.ya.

“Boji De Miru Mikkyo - Sono Osie, Imi, Kakikata” (Kodama Yoshitaka, 2002, DaiHourinkaku)

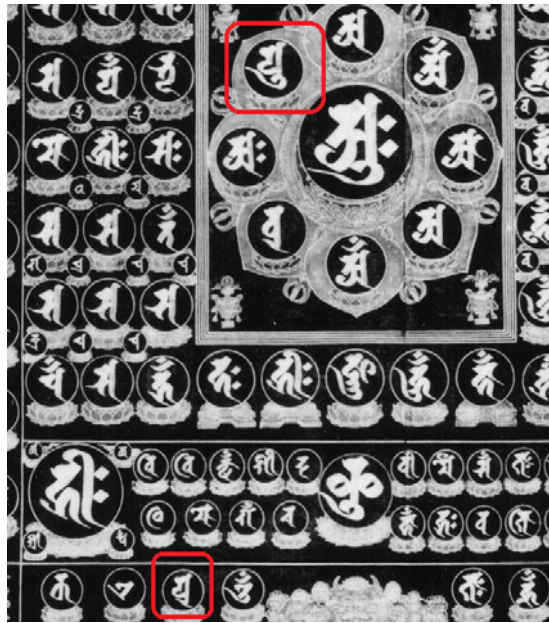


Figure 9: Taizo-mandara which indicates the world of Mahaa-virocana suutra. It includes two types of yu to distinguish between Maitreya and Mahaamaayuurii..

“Bonji Kichou Siryou Shuusei - Zuhanhen” (Bonji Kichou Sryou Shuusei Kankoukai, 1980, Tokyo Bijutsu) p. 384

### 3. Representative Glyphs of the Syllables including U/UU in Various Tutorial Materials

As L2/14-055 shows an example (Figure 10) in the discussion about the idea of the default glyph shape for each syllables, some Siddham documents use the vowel sign proposed at U+115E4 as the default shape for the syllable DHU (and do not use the representative shape at U+115B2).

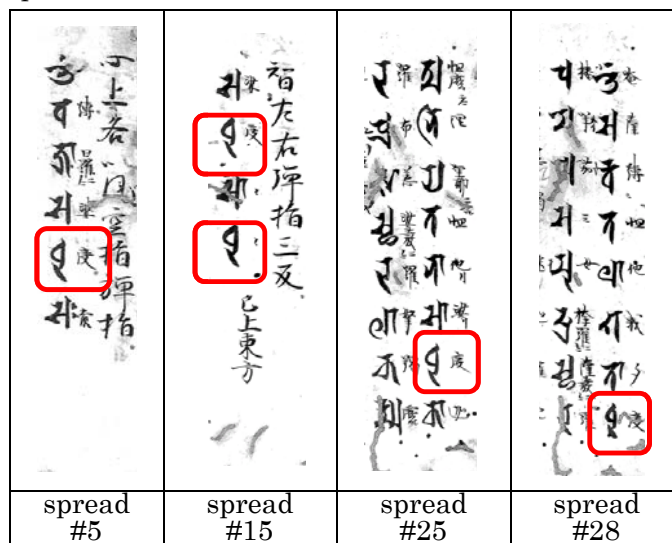


Figure 10: A Document Which Never Uses the Cloud Form for the Syllable "Dhu". (金部繪 (1192), manuscript preserved in Toyo Bunko)

Andrew Glass concerned that the invalid combination (see L2/14-062); if U+115E4 specifies the shape concretely, the combination of the consonant U+115A0 (DHA) and U+115B2 would be invalid? How the font and glyph shaper should be implemented for such invalid combinations?

As the original Siddham proposal by Anshuman Pandey (WG2 N4185), there are many different preferences in each school, master and user community. I collected several Siddham tutorial materials from Nagasaki and Motoyama:

- Bonji Taikan (ISBN 978-4895511155, 2000) including the ligatures for basic syllables written by Kodama "Giryu" Yoshitaka.
- "Sittan Bonjishou Chuushou" a manuscript by Seiyo (written around 1161) preserved in Japanese National Diet Library.
- "Sittan 18 Shou"(\*) 3 versions of same titled manuscripts from Prof. Motoyama's collection.

(\*) Typical Japanese Siddham tutorial texts classify the Siddham ligatures into 18 groups, and the tutorial texts consists from 18 sections (based on Xitan Ziji by Zhi-guang, see section 3.9 in WG2 N4185 or WG2 N4294), thus, the tutorial texts are often titled as "Sittan 18 Shou (悉曇十八章)"

- "Sittanzo" 2 versions reprinted in Dainihon Bukkyo Zensho (Suzuki Gakujutsu Zaidan, 1973)
- "Sittanzo" reprinted in Taisho Tripitaka (Vol.84, No.2702)
- "Sittan Yoketsu" reprinted in Taisho Tripitaka (Vol.84, No.2706)

and clipped the representative glyphs for the syllables including U and UU (Figure 11 - Figure 14). From the result, it is expected that there is no invalid composition.

	Bonji Taikan	Bonji Sittanshou Shouchuushou	Sittan 18 Shou (1)	Sittan 18 Shou (2)	Sittan 18 Shou (3)	Sittanzo (Dainihon Bukkyo Zensho 235A)	Sittanzo (Dainihon Bukkyo Zensho 235B)	Sittanzo (Taisho Tripitaka)	Sittan Yoketsu (Taisho Tripitaka)
KU	 ku								
KUU	 kū								
KHU	 khu	no referential glyph explicitly							
KHUU	 khū	no referential glyph explicitly							
GU	 gu	no referential glyph explicitly							
GUU	 gū	no referential glyph explicitly							
GHU	 ghu	no referential glyph explicitly							
GHUU	 ghū	no referential glyph explicitly							
NGU	 ngu	no referential glyph explicitly							
NGUU	 nū	no referential glyph explicitly							
CU	 cu								
CUU	 cū								
CHU	 cchu	no referential glyph explicitly							
CHUU	 cchū	no referential glyph explicitly							
JU	 ju	no referential glyph explicitly							
JUU	 jū	no referential glyph explicitly							
JHU	 jhu	no referential glyph explicitly							
JHUU	 jhū	no referential glyph explicitly							

Figure 11: Comparison of Siddham Tutorial Materials (pt. 1)





























































































































































NYU	 nyu	no referential glyph explicitly							
NYUU	 nyuu	no referential glyph explicitly							
TTU	 tu								
TTUU	 tuu								
TTHU	 tthu	no referential glyph explicitly							
TTHUU	 tthuu	no referential glyph explicitly							
DDU	 du	no referential glyph explicitly							
DDUU	 duu	no referential glyph explicitly							
DHU	 dhu	no referential glyph explicitly							
DHUU	 dhuu	no referential glyph explicitly							
NNU	 nu	no referential glyph explicitly							
NNUU	 nuu	no referential glyph explicitly							
TU	 tu	no referential glyph explicitly							
TUU	 tuu	no referential glyph explicitly							
THU	 thu	no referential glyph explicitly							
THUU	 thuu	no referential glyph explicitly							
DU	 du	no referential glyph explicitly							
DUU	 duu	no referential glyph explicitly							
DHU	 dhu	no referential glyph explicitly							

Figure 12: Comparison of Siddham Tutorial Materials (pt. 2)














































































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NU	 nu								
NUU	 nū								
PU	 pu								
PUU	 pū								
PHU	 phu	no referential glyph explicitly							
PHUU	 phū	no referential glyph explicitly							
BU	 bu								
BUU	 bū								
BHU	 bhu	no referential glyph explicitly							
BHUU	 bhū	no referential glyph explicitly							
MU	 mu	no referential glyph explicitly							
MUU	 mū	no referential glyph explicitly							
YU	 yu								
YUU	 yū								
RU	 ru								
RUU	 rū								
LU	 lu								
LUU	 lū								

Figure 13: Comparison of Siddham Tutorial Materials (pt. 3)






































































































VU	 vu	no referential glyph explicitly							
VUU	 vū	no referential glyph explicitly							
SHU	 śu								
SHUU	 śū								
SSU	 ṣu	no referential glyph explicitly							
SSUU	 ṣū	no referential glyph explicitly							
SU	 su	no referential glyph explicitly							
SUU	 sū	no referential glyph explicitly							
HU	 hu								
HUU	 hū								
KSU	 ksu								
KSUU	 ksū								

Figure 14: Comparison of Siddham Tutorial Materials (pt. 4)

#### 4. Proposal to Separate Vowel Sign U/UU Variants by Their Shapes

Considering the result of the comparison of Siddham tutorial materials, Andrew Glass proposed to encode the vowel sign variants at different codepoints, by considering the shape difference. It is different from original proposal from Japanese Siddham experts that use the existing code point for generic use and additional code point for special use. The outline of the proposal by Andrew Glass follows;

- Encode the alternate forms for the combining U and UU matras
- Name them explicitly per the shape of the alternate form, i.e.,
  - SIDDHAM VOWEL SIGN ALTERNATE U
  - SIDDHAM VOWEL SIGN ALTERNATE UU

There is precedent for this naming style in the Phags-pa and other ranges, see U+A86D, U+10161, U+10167, U+10176.

- Add annotations to both the normal and alternate forms of U and UU so it is clear which

is for the cloud form and which is for the warbler form

115B2 SIDDHAM VOWEL SIGN U

§ Cloud form of vowel sign

→ 115E4 siddham vowel sign alternate u

115B3 SIDDHAM VOWEL SIGN UU

§ Cloud form of vowel sign

→ 115E5 siddham vowel sign alternate uu

115E4 SIDDHAM VOWEL SIGN ALTERNATE U

§ Warbler form of vowel sign

→ 115B2 siddham vowel sign u

115E5 SIDDHAM VOWEL SIGN ALTERNATE UU

§ Warbler form of vowel sign

→ 115B3 siddham vowel sign uu

- Provide collation weights so that the alternate forms are distinguished from the primary forms with tertiary weight. For example,

115B2 ; [.2881.0020.0002] # SIDDHAM VOWEL SIGN U

115B3 ; [.2882.0020.0002] # SIDDHAM VOWEL SIGN UU

115E4 ; [.2881.0020.0005] # SIDDHAM VOWEL SIGN U

115E5 ; [.2882.0020.0005] # SIDDHAM VOWEL SIGN UU

(end of the outline of the proposal by Andrew Glass)

At present (2014/02/23), no objection is raised from the experts participated in Siddham ad-Hoc at Tokyo. Therefore, Andrew's proposal would be a good start point to form a consensus in WG2 #62 meeting.

### Acknowledge

I appreciate Andrew Glass, Anshuman Pandey, Kiyonori Nagasaki, Kouju Motoyama and Taichi Kawabata, for their excessive research and discussion. Also I appreciate Ken Lunde and Deborah Anderson for chairing our discussion after UTC#138.

(end of document)