Proposal for Encoding of Vaidika Characters & Symbols in Unicode

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Title: Proposal to encode 68 characters for Encoding of Vaidika Sanskrit Characters & Symbols in the BMP of UCS
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This Draft proposal dated 23 January 2008 is prepared by Prof. R. K. Joshi and Dr. Alka S. Irani and her team of LCG, C-DAC Mumbai in collaboration with Micheal Everson and Peter Scharf and their team and is a consolidation of their earlier proposals L2/07-39{5,6,7} dated 2007-10-18 and L2/07-343 dated 2007-10-18 respectively.

This proposal was advised by Shri. Bharat Bhushan, JS&FA, GC, LCG, Ministry of Communications and Information Technology (MC&IT), Govt. of India, guided and supervised by Smt. Swaran Lata, Director & HOD (HCC DIV), MC&IT, Govt. of India and co-ordinated by Shri. Manoj Jain, Joint Director, HCC, MC&IT, Govt. of India.

This proposal was drawn in consultation with various scholars, technologists and representatives of Institutes from India and abroad. Their contribution at various stages is greatly appreciated and hereby acknowledged.

The following documents (duly put up on the South Asian Sub-committee as per Unicode UTC# 113, Oct 2007 http://www.unicode.org/~emuller/southasia/vedic/) were duly considered in this revised combined single proposal.

Documents
The Everson, Scharf et al. proposals:

- 2007-10-18: L2/07-343; differences with L2/07-230 in L2/07-394
- 2007-07-26: L2/07-230; history of that document in L2/07-262
- 2007-04-26: L2/07-095R
  - Comments in L2/07-388
    - Comments in L2/07-400

The Government of India proposals:

- 2006-05-10 L2/06-185

Comparisons:

- 2007-10-18: L2/07-401: L2/07-343 vs. L2/07-39{5,6,7}
- 2007-08-08: L2/07-271: L2/07-230 vs. L2/06-185
  - Response in L2/07-386
    - Comments in L2/07-400
Opening Remarks

In the earlier proposal document L2/07-39(5, 6, 7) 79 character codes were identified under the block entitled Vaidika Extensions and requested for its inclusion in the suitable slot in the BMP of UCS.

And, in the earlier document No.L2/07-343 dated 2007-10-18, 53 characters were identified under Devanagari extended (23) and Vedic extensions (24) and Devanagari (6).

The comparative summary and comments on the above proposals in the South Asia sub-committee http://www.unicode.org/~emuller/southasia/vedic/ under 3.1 to 3.11, has been taken into account in preparing of this Combined Revised Single Proposal (as per UTC# 113 advise). We have made our observations for Samavedic letters and digits (3.3) and Samavedic, others (3.4) and have presented our recommendations for encoding the same in Vaidika extensions B.

In this Revised Combined Single Proposal, the 68 characters for encoding purpose are as follows:
In the Vaidika Extensions A (1CD0 – 1CFF), 38 characters have been recommended for codes, and in Vaidika extensions B (A8E0 – A8FF), 27 characters have been recommended for codes which are for Samaveda. The two codes A8FE and A8FF namely Vaidika prarambha Chihna and Vaidika Antha Chihna have been provided for addressing syllabic tonal/accent marks in Jaiminiya branch. Three characters has been recommended to be added in Devanagari 09 block. The Samavedic syllabic marks as found in Jaiminiya branch have been kept open for the want of adequate document evidences.

This draft proposal have been discussed and consolidated with the help of many Vaidika Sanskrit scholars, Sanskrit academicians, linguists, technologists from various academic research institutions in India and abroad and Government of India officials. Their valuable contributions are duly acknowledged.
Introduction

The ancient holy text in India is known by the name of the Veda. The word Veda is derived from the root verb “vid”- to know, to attain the knowledge. There are 4 Vedas namely RigVeda, YajurVeda, SaamaVeda and AtharvaVeda. Composed in verse format using Sanskrit language, the contents of these Vedas are of spiritual, philosophical and practical nature and are to be vocalized in terms of recitation, chanting, singing, etc. The collections of the Mantras (the compositions in poetry and prose form) of the four Vedas were further divided into Shaakhaas (branches). The classes of reciters known as Vaidikas belonging to individual branches have retained their chanting characteristics while vocalizing the Mantras. This oral mode acquired a great significance in ancient India in terms of Teacher-students tradition (guru-shishya paramparaa). At later stage such oral recitations had to be written down by Pandits in order to retain the knowledge in the written mode. To write such Vaidika text with vocal nuances, various signs (svaraankana-paddhati) were devised and placed around syllables. These are called Vaidika accent and tonal signs. It is interesting to note that a single chant if vocalised by the Vaidikas of different branches, would have slight variation in terms of nasalization, intonation, continuum, stress etc. And to indicate these differences, many variants of a single sign have been developed. For example, there are 15 variations of Anusvaara indicated by 15 graphic signs with slight variations in their visual forms. The selective usage of these signs indicates that the particular text is from a particular branch of Veda.

It is observed that there is a Vaidika tradition of hand movements (Hasta-Mudraas) to suggest the proper way of intonation while chanting the Mantras.

Sanskrit is one of the most ancient languages of the world, which has moulded the culture and the thought systems not only of India but also of many other countries in Asia. Sanskrit is not a dead language. Sanskrit was for over a millennium, a living spoken language with a considerable literature of its own. Besides works of literary value, there was a long philosophical and grammatical tradition.

Many Universities in India and abroad are involved in the Vaidika studies as a specialized subject. Traditional Vaidika Paathashaalaas in various parts of India are involved in imparting the practice and knowledge of Vaidika oral tradition. Temples and Mathas are providing support for learning and teaching Vaidika texts. Various research institutes are actively involved in bringing out critical editions of the Vaidika texts and various research activities in this field.

1. The range of Vaidika texts

The Vaidika texts refer to the four groups of Vedas namely RigVeda, YajurVeda (Shukla and Krishna), SaamaVeda and AtharvaVeda. The range of Vaidika texts extend to their respective Shaakhaas, Upashaakhaas (branches-subbranches), Samhitaas, Braahmannas, Aarannyakas, Upanishads, Shrautasuutras, Praatishaakhyas and Shikshaas. Originally, the Vaidika text (mostly in verse form)
—Samhitaas along with their respective Padapaathas exist in the oral mode and were passed on from Guru to Shishya through various processes such as Shravanna (listening), Anuchchhaaranna (repetition), Arthabodha (understanding of the meaning), Kannthasthiikaranna (memorisation), Charchaa-Samvaada (discussion) and Prashnottara (Questions &Answers).

Later on when these texts were written (with appropriate methodologies and materials, the need was felt to introduce Vaidika Svaraankana Chihnas (accent/tonal marks, signs and symbols) as a guide for proper pronunciation (and hence proper reading) of such texts.

The Shikshaas cover the study of the terms such as Varna (letters of alphabet), Svara - (accents like Udaatta, Anudaatta and Svarita), Maatraa (the time measurement required for the pronunciation), Bala (stress - in context to sthaana and prayatna) etc.

The Praatishaakhyaas constitute studies on phonetics, which prevailed in ancient India in different schools of the Vedas. Each Praatishaakhya with the ancient phonetic system was applicable to a particular school of each Veda. Some of the Praatishaakhyaas such as Taittiriiya covered subjects like Uchchaaranna-kalpa - formation of articulate sounds and more of their production.

2. Vaidika texts with Svaraankana Chihnas

One of the most significant characteristics of Vaidika language is its proper accentuation system in utterances of its words, sentences as well as prose and versified compositions.

Vaidika text with Svaraankana Chihnas is available in various groups of Vaidika literature such as Samhitaas, Braahmannas, Aarannyakas and Upanishads. Besides, various Pratishaakhyaas and Shikshaagranthas have discussed the theoretical as well as grammatical and practical aspects of ‘Uchchaaranna’ (accentology) supported by examples of Svaraankana Chihnas (accentography) as well as their contextual rules.

Various branches of RigVeda, YajurVeda, SaamaVeda and AtharvaVeda are marked with ‘Svaras’. It is observed that the Vaidika text and its accent marks vary in their application and presentation as per its branch, sub-branch, tradition and location.

For example:
In RigVeda, the Udaatta Svara is left unmarked. In Rigveda and YajurVeda the Svarita Svara is marked with short vertical line on the top of a syllable. The same sign appears as Anudaatta mark below a syllable in AtharvaVeda (Paippalaada Shaakhaa).
3. The importance of Svaraankana Chihnas

Svaraankana Chihnas are very useful devices in more than one way. On one hand these marks represent nuances of pronunciation and on the other hand these marks are used for semantic differentiation as well.

3a. Svaraankana Chihnas are used in each Pada (word) as to help to understand the proper meaning (Arthabodha) of a Mantra.

3a.1 The knowledge of the kind of Samaasapada

- The killer of Indra

Tatpurusha samaas

- The one for whom Indra is an enemy

Bahuvrihi samaas

3a.2 For Gender classification

- Adjective, Feminine Gender

- Adjective, Masculine Gender

3b Svaraankana Chihnas are useful in context of deciding the grammatical status of a pada.

- Noun

- Adjective
3c  *Svaraankana Chihnas* are used in context to sentence classification. Some words in a sentence are accented and some are not, creating the correct meaning.

3c1. The verb in the principle clause is unaccented whereas in the subordinate clause it is accented.

3c2. In a given sentence, if a speaker does not give any stress on the *pada*, then it is marked as a *Sarvaanudaatta*. Whereas, if a speaker wants to give a stress in the beginning of the word then that is accented.

3c3. If there is a concept of addressing someone (vocative) in the beginning of a sentence then the first syllable of the *pada* will be accented.

4. **The Contextual aspect of Svaraankana Chihnas**

The *Svaraankana Chihnas* of Vaidika Sanskrit are not independent signs. They do not behave as punctuation marks. The *Svaraankana Chihnas* are positioned all around the syllable. Some of them are of zero width and some have positive widths. However, these marks with positive widths cannot be termed as letters. Most of these marks are dependent on the context i.e. preceding syllable and or following syllable. Further, these positive width marks can take zero width marks above or below of them and are governed by linguistic rules as per grammar.

4.1 In *Samhitaa* text and in the *Padapaatha*, different signs are noticed in case of the same *pada*. *(Vaajasaneyi Maadhyanidina Shukla YajurVeda Samhitaa pg102/5.27).*

- Samhitaa

- Padapaatha

4.2 Vaidika *Anusvaara*, when it occurs in the *Samhitaa* is affected by the pronunciation of the subsequent sound. When *Samhitaa* is split into *padapaatha*, due to the pause that follows after the *Anusvaara*, the *Anusvaara* sounds differently so it is shown with two different signs in the *Samhitaa* and *Padapaatha*.

- Samhitaa
Here the Anusvāra is changed to `M' in the Padapaatha.
Vaajasaneyi Maadhyandina Shukla YajurVeda Samhitā (pg106/5.35).

4.3 The Anusvāra, which is inside the pada remains as it is.
This Anusvāra is not caused by any factor outside of that word itself,
but is there in the process of the formation of the pada.
Vaajasaneyi Maadhyandina Shukla YajurVeda Samhitā (pg129).

All these and similar cases of an Svaraankana Chihna are
appropriately reflected in the property data provided in this draft proposal.

5. The identified range, positioning and compositions of Svaraankana Chihnas

5a. The total number of 32 Vedic Sanskrit signs were identified in the
`Extended character set for Vedic' in the ISCII document Annex-G
(IS13194: 1991). The extension character (EXT), defined in ISCII, was
to be followed by another character in the range of A1 Hex to EE Hex,
to yield additional 32 characters needed for Vedic Sanskrit text with
such accent marks.

5b. Further, the additional Vaidika accent signs (Svaraankana Chihnas)
were observed from various sources- manuscripts/printed texts.

These signs were discussed and debated regarding their multiple
usages, redundancies, earlier technology restraints, multiple shapes
and usability factors.
5c. From the total of identified 102 Vaidika signs, the codes for 68 Vaidika characters have been chosen and recommended as candidates for Unicode in this draft proposal.

The 68 Vaidika signs can be classified as follows:

- VAIDIKA ANUSVAARA 14
- VAIDIKA VISARGA 6
- VAIDIKA SVARITA 13
- VAIDIKA SAAMASVARA 25
- VAIDIKA SYMBOLS 5
- VAIDIKA JAIMINIYA SPEACIAL SIGNS 2
- DEVANAGARI 3

Through this range of codes, following texts can be addressed:

1. **Rigvedic Text**: for example 1CE7,1CEF from Vaidika Extensions 0951,0952 from Devanagari etc
2. **Yajurvedic Text**: for example 1CEB,1CEA,1CE9,1CE5,1CE8 etc
3. **Samavedic Text**: for example A8E0, A8E1, A8E2, A8E3, A8E4, A8E5 etc.
4. **Atharvavedic Text**: for example 1CE4,1CEC,1CED etc
5. **Nasal/Tonal narks**: for example 1CD1,1CD8,1CDC,1CE3 etc
6. **Vaidika Symbols**: for example 1CF1, 1CF2, 1CF3 etc
7. **Samavedic Text**:

   **Jamaniya Shaakha:**
   In case of Samavedic text of Jaiminiya Shaakha, it is observed that they have different system of syllables to be used as accent marks. These marks need to be handled through a separate soft tool or can be addressed by introducing two new codes namely A8FE & A8FF.

6. **The compositional rules**

The Vaidika Swaraadi Chihnas, Vaidika Svaraankana Chihnas, Vaidika Saamasvara Chihnas are to be rendered above, below and/or right side of the syllable.

The types of Svaraankana Chihnas and their compositional rules are given separately.
### Vaikiki Extentions A

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**Summary:**

VAIKIKA EXTENTIONS A = 38 signs  
VAIKIKA EXTENTIONS B = 27 signs  
DEVANAGARI = 3 sign

TOTAL = 68 signs
### Vaidika Anusvāra

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## VAIDIKA SYMBOLS

| 1CF1 |  | VAIDIKA PUSHPIKA |
| 1CF2 |  | VAIDIKA MAATRAAKAAL |
| 1CF3 |  | VAIDIKA TIRYAK |
| 1CF4 |  | VAIDIKA SWASTIKA |
| 1CF5 |  | VAIDIKA TRUTIKAA |
### VAIDIKA SAAMASVARA

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### DEVANAGARI

(23 JANUARY 2008)

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Proposal for Encoding of Vaidika Characters & Symbols in Unicode

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Proposal for Encoding Of Vaidika Characters & Symbols in Unicode
Vaidika Marks Rendering Rules:
23 January 2008

Proposed revised text for R10

R 10: Other modifying marks, in particular bindus and svaras, apply to the orthographic syllable as a whole and should follow (in the memory representation) all other characters that constitute the syllable. The bindus should follow any vowel signs, and the svaras should come last. The relative placement of these marks is horizontal rather than vertical; the horizontal rendering order may vary according to typographic concerns. *The Vaidika Swaraadi Chihnas, Vaidika Svaraankan Chihnas, Vaidika Saamasvara Chihnas are to be rendered above, below and/or right side of the syllable.*

Existing Examples:

- KA₁ + AAₜ + CANDRABINDU₁

   क + ा + ं → काँ

Additional Examples of Vaidika Swaraadi Chihna:

**Class A:** Single vowel syllable:

AAₜ + VAIĐIKA VISARGAₜ

   आ + ☀ + ☽ → आ ☽

**Class B:** Single consonant syllable:

KAₜ + Iₜ + VAIĐIKA ANUSVAARAₜ

   क + ि + ः → किः

HAₜ + AAₜ + VAIĐIKA ANUSVAARAₜ + VAIĐIKA TIRYAK + VAIĐIKA SVARITAₜ

   ह + ा + ☀ + ☽ + ☽ → हाँ ☽

**Class C:** Multiple consonant syllable:

TAₜ + VIRAMAₜ + VAₜ + VAIĐIKA ANUSVAARAₜ

   त + ☽ + व + ☽ → तवः

VAₜ + IIₜ + VAIĐIKA ANUSVAARAₜ + VAIĐIKA SVARITAₜ + SHAₜ + VIRAMAₜ + CAₜ

   व + ि + ☽ + ☽ + श + ☽ + च → विश्व
Examples of Vaidika Svaraankan Chihna:

**Class A: Single vowel syllable:**

\( AA_n + \text{VAIDIKA SVARITA}_n \)

\( \text{आ + } \text{ो} \rightarrow \text{ो} \)

**Class B: Single consonant syllable:**

\( MA_n + \text{VISARGA}_n + \text{VAIDIKA SVARITA}_n \)

\( \text{म + ओ + } \text{ो} \rightarrow \text{म:} \)

**Class C: Multiple consonant syllable:**

\( SA_n + \text{VIRAMA}_n + TA_n + U_n + \text{VAIDIKA SVARITA}_n \)

\( स + त + उ + ओ \rightarrow र्न्तु \)

Examples of Vaidika Saamasvara Chihna:

**Class A: Single vowel syllable:**

\( O_n + \text{VAIDIKA SAAMASVARA}_n \)

\( ओ + \text{ो} \rightarrow ओ \)

**Class B: Single consonant syllable:**

\( THA_n + AA vs + \text{VAIDIKA SAAMASVARA}_n \)

\( थ + ओ + \text{ो} \rightarrow था \)

**Class C: Multiple consonant syllable:**

\( TA_n + \text{VIRAMA}_n + SA_n + U vs + \text{VAIDIKA SAAMASVARA}_n \)

\( त + ओ + स + उ + \text{ो} \rightarrow र्न्तु \)
Proposal for Encoding Of Vaidika Characters & Symbols in Unicode

Acknowledgements: for references and source material

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Prof. R. K. Joshi
23 January 2008
ISO/IEC JTC 1/SC 2/WG 2  
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS  
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646†

A. Administrative

1. **Title:** Proposal for Encoding Of Vaidika Characters & Symbols in Unicode  
   Department of Information technology, Ministry of Communications & IT,  
   Government Of India

2. Requester's name: Department of Information technology, Ministry of Communications & IT,  
   Government Of India

3. Requester type (Member body/Liaison/Individual contribution): Member Body

4. Submission date:

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: No

B. Technical – General

1. Choose one of the following:  
   a. This proposal is for a new script (set of characters): Vaidika Extensions
   b. The proposal is for addition of character(s) to an existing block: Not Applicable

2. Number of characters in proposal: 68

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 E-Minor extinct  
   F-Archaic Hieroglyphic or Ideographic G-Obscure or questionable usage symbols

4. Is a repertoire including character names provided? Yes

5. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for  
   Publishing the standard? CDAC Mumbai
   If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools  
   used: Fontographer V 4.1

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 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.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?  
   If YES explain The Proposal was submitted to UTC in 2003 (L2/03-066 and L2 /03-067) and it were also discussed in UTC#101. The proposal was resubmitted to UTC in 2006 (L2/06-185). A further revised proposal was submitted to UTC in October 2007 (L2/07-395,396,397).

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.)?  
   If YES, with whom? Vaidika Sanskrit Scholars, Linguists, IT experts working in language technology, Industry Representatives, Sanskrit Scholars etc.

3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?  
   Reference: The type of usage can be very from common to rare

4. The context of use for the proposed characters (type of use; common or rare)  
   Reference: Critically edited versions of Scholarly Publications

5. Are the proposed characters in current use by the user community?  
   If YES, where? Reference: The proposed characters are used in Indian Scripts

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?  
   If YES, is a rationale provided? Yes

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?  
   If YES, is a rationale for its inclusion provided? No

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

10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?  
    If YES, is a rationale for its inclusion provided? Yes

11. Does the proposal include use of combining characters and/or use of composite sequences?  
    If YES, is a rationale for such use provided? No

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

13. Does the proposal contain any Ideographic compatibility character(s)?  
    If YES, is the equivalent corresponding unified ideographic character(s) identified? No