

**ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹**

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://std.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://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. Title:	Proposal to Encode Ranjana Script in ISO/IEC 10646		
2. Requester's name:	<i>Dev Dass Manandhar, Samir Karmacharya and Bishnu Chitrakar</i>		
3. Requester type (Member body/Liaison/Individual contribution):	<i>Individual contribution</i>		
4. Submission date:	<i>2013/12/31</i>		
5. Requester's reference (if applicable):	<i>Annex-I</i>		
6. Choose one of the following:			
This is a complete proposal:			<i>Yes</i>
(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):			<i>77</i>
Proposed name of script:	<i>RANJANA</i>		
b. The proposal is for addition of character(s) to an existing block:			
Name of the existing block:			
2. Number of characters in proposal:			<i>77</i>
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?			<i>YES</i>
a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?			<i>YES</i>
b. Are the character shapes attached in a legible form suitable for review?			<i>YES</i>
5. Fonts related:			
a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?	<i>Samir Karmacharya</i>		
b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):	<i>Samir Karmacharya, Kalimati, Kathmandu, Nepal, saneer@gmail.com and saneer@hotmail.co.uk</i>		
6. References:			
a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?			<i>YES</i>
b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?			<i>YES</i>
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)?			<i>YES</i>
	<i>Collation order, Rendering the Ranjana script and Building characters from UCS</i>		

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.

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?	Buddhist communities, Archeological department Government of Nepal, Raja Shakyas(former script lecturer Tribhuwan University, and librarian, Asha Sapu Kuthi)
If YES, available relevant documents:	NO
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?	YES
Reference:	Annex-II Ranjana script on display
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:	Books, Magazine, Letterheads, Signboards Annex-II
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, 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?	NO
If YES, is a rationale for such use provided?	
If YES, reference:	
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 characters?	NO
If YES, are the equivalent corresponding unified ideographic characters identified?	
If YES, reference:	

Proposal to Encode Ranjana Script in ISO/IEC 10646
Authors Dev Dass Manandhar, Samir Karmacharya and Bishnu Chitrakar
December 31st, 2013

Please add the attached document to the document registry.

1 Introduction

Ranjana script (a holy script) is in fact one of the beautiful scripts written with a tilted nib. It is believed that the script was created and used by native people (Newaa: community) of Nepal. It is about a millennium old and derived from Brahmi (Dhamalipi, as named by Emperor Ashok) script. Its evolution can be seen from the documents preserved in the department of Archeology, Ministry of Culture in Kathmandu, Nepal.

Many Mahaayaana Buddhist Mantras and philosophical ritual book like Pragynaapaaramitaa (also written in golden and silver ink), were written and rewritten for daily recitation on palmleaf and later in printing papers. All over the world, the mantras of Buddhism were also written on the walls and ceilings of Buddhist monasteries in this script.

Newaa: community (1,321,933, Census 2011) is the major users of this script in the past and at the present. Beside its uses in Buddhist Mantras, the community uses the script in daily life like in books, sign boards, letter heads, names etc. Every day, the Pragynapaaramitaa is recited by Bajrayaani Buddhist monks in the golden temple of Yala/Hiranyavarna Mahawihar Monastery (Golden Temple, Patan)/.

A monthly magazine named Luaakha: has been in publication for the past few years with the help of the transliteration software /RANJANA THAHITY, devised by the authors Dev Dass Manandhar and Samir Karmacharya/.

This proposal is based on the native monosyllabic language of the Newaa: community, Nepaalabhaasaa. Classical Nepaalabhaasaa uses six vowels, thirty consonants and two semivowels.

Each vowel is used in four different forms of pronunciation to represent independent words. For example, the four different forms of a vowel /**ṛA**/ are: Normal sound/**ṛ**/, Long sound/**ṛṣ**/, Nasalized sound/**ṛ̃**/ and Long nasalized sound/**ṛ̃ṣ**/ . Thus the proposal contains twenty-four vowels that includes all the four forms of six vowels.

Consonant as independent character, does not exist in the native writing system. Characters are understood as alphasyllabic with a vowel /**ṛA**/ at the end. Thirty-two characters with a vowel /**ṛA**/ is known as /Baa-aakha:/ in Nepaalabhaasaa that includes two semivowels.

The thirty characters with a vowel /**ṛA**/ are:

ṛKA, ṛKHA, ṛGA, ṛGHA, ṛNGA, ṛNGHA, ṛCA, ṛCHA, ṛJA, ṛJHA, ṛNJA, ṛNJHA, ṛTA, ṛTHA, ṛDA, ṛDHA, ṛNA, ṛNHA, ṛPA, ṛPHA, ṛBA, ṛBHA, ṛMA, ṛMHA, ṛRA, ṛRHA, ṛLA, ṛLHA, ṛSA and ṛHA.

Two semivowel characters with a vowel /**ṛA**/ are: **ṛYA(EA)** and **ṛWA(OA)**.

The modern Nepaalabhaasaa uses seven allographs to represent different pronunciations for borrowed/foreign, loan/ words. The seven allograph characters with a vowel /अ/ are:

दाTTA allograph of ताTA, दाTTTHA allograph of दाTHA, दाDDA allograph of दाDA, दाDDHA allograph of दाDHA, दाNNA allograph of नाNA, दाSHA and दाSSA allograph of दाSA.

The thirty-nine alphasyllabic characters/Baa-aakha:/ are the basic characters pronounced with a vowel /अ/. Their shape, size and look are different when used with different vowels as alphasyllabic characters.

For example, character /का/ with a vowel other than /अ/ are different. Different shapes of the base character /क/ as alphasyllabic are listed in the Table T-1.

Table-1 Different shapes and looks of Alphasyllabic character/क/.

Character /K/	with a vowel	With a long vowel	With a nasalized vowel	With a long nasalized vowel
Vowel /अ/	का	काः	काँ	कां
Vowel /आ/	का	काः	काँ	कां
Vowel /इ/	कि	की	किँ	किं
Vowel /उ/	कु	कु	कुँ	कुं
Vowel /ए/	के	केः	केँ	कें
Vowel /ओ/	को	कोः	कोँ	कों

From the Table-1, it is clear that the alphasyllabic characters have different looks with different vowels. Most of the alphasyllabic characters are independently used.

On the basis of thirty-nine alphasyllabic characters from the Ranjana script, characters without a vowel /अ/ are proposed for encoding as atomic characters in UNIVERSAL CHARACTER SET (UCS).

The other required characters are reproduced by the combination of proposed UCS characters.

Many characters used in this script are excluded because of their non-atomic nature. They are reproduced by the combination of proposed atomic characters.

For example, from the proposed vowel /**𑂔**A/, ligatures like /**𑂔𑂔**AI/ is re-constructed with a vowel /**𑂔𑂔**I/ and /**𑂔𑂔**AU/ with a vowel /**𑂔𑂔**U/.

For example from the proposed character /**𑂔**K/, other required characters such as clusters/**𑂔𑂔**KK(/**𑂔**K and **𑂔**K)/, a ligatures/**𑂔𑂔**(**𑂔**K and **𑂔**SS)/ and alphasyllabic characters/**𑂔**...**𑂔𑂔**...**𑂔𑂔** / are re-constructed by the proposed rendering process for the Ranjana script.

Characters can be stacked from top to bottom to make a cluster /**𑂔**K, **𑂔𑂔**KK/. Multiple stacked characters as a cluster is known as /KUTAAKSSARA/. The famous /KUTAAKSARA/ of seven characters /**𑂔**H, **𑂔**X, **𑂔**M, **𑂔**L, **𑂔**W, **𑂔**R and **𑂔**YM/ is presented in Picture-1.



The multiple stacking of characters is limited due to vertical spacing. Therefore KUTAAKSARA is avoided in UCS. Many symbols are used along with other characters in this script. HAKSSAMALAWARAYA is included in atomic form as a base symbol to reproduce other symbols.

Picture-1 HAKSSAMALAWARAYA embosed on a brass double triangle flag in Hiranyawarna mahaawihaara monastery.

(Two symbols /:/ and / / are used to represent long sound and nasalized sound respectively.)

2 Universal Character Set (UCS)

The presented code chart is different from the popular Indic script format. The current proposal is based on the users' requirements. The code presented in this proposal contains seventy six characters which includes Vowels(24), Consonants(37), Semi-vowels(2), Punctuation marks(2), Numerals(10) and Symbol(1).

2.1 Vowels

The user community has six prime vowels. They are अA, आAA, इI, उU, एE and ओO.

Each vowel has three more formats. They are long, nasalized and long nasalized vowels.

These are the following:

Long Vowels : अः A:, आः AA:, इः I:, उः U:, एः E: and ओः O:.

Nasalized Vowels : अ A, आ AA, इ I, उ U, ए E and ओ O.

Nasalized Long Vowels : अः A:, आः AA:, इः I:, उः U:, एः E: and ओः O:.

Code Point	Character	Character name
XX00	अ	RANJANA LETTER A
XX01	अः	RANJANA LETTER LONG A
XX02	अं	RANJANA LETTER NASAL A
XX03	अं	RANJANA LETTER LONG NASAL A
XX04	आ	RANJANA LETTER AA
XX05	आः	RANJANA LETTER LONG AA
XX06	आं	RANJANA LETTER NASAL AA
XX07	आं	RANJANA LETTER LONG NASAL AA
XX08	इ	RANJANA LETTER I
XX09	इः	RANJANA LETTER LONG I
XX0A	इं	RANJANA LETTER NASAL I
XX0B	इं	RANJANA LETTER LONG NASAL I
XX0C	उ	RANJANA LETTER U

XX0D	𑌔	RANJANA LETTER LONG U
XX0E	𑌕	RANJANA LETTER NASAL U
XX0F	𑌖	RANJANA LETTER LONG NASAL U
XX10	𑌗	RANJANA LETTER E
XX11	𑌘	RANJANA LETTER LONG E
XX12	𑌙	RANJANA LETTER NASAL E
XX13	𑌚	RANJANA LETTER LONG NASAL E
XX14	𑌛	RANJANA LETTER O
XX15	𑌜	RANJANA LETTER LONG O
XX16	𑌝	RANJANA LETTER NASAL O
XX17	𑌞	RANJANA LETTER LONG NASAL O

2.2 Consonants

Characters represented in the UCS chart are the characters without a vowel /𑌐A/. Thirty-seven characters of Ranjana script presented in this proposal as consonants, each has a unique sound with a unique meaning.

They are :

𑌑K, 𑌒KH, 𑌓G, 𑌔GH, 𑌕NG, 𑌖NGH,;

𑌗C, 𑌘CH, 𑌙J, 𑌚JH, 𑌛NJ, 𑌜NJH,;

𑌝T, 𑌞TT, 𑌟TH, 𑌠TTH, 𑌡D, 𑌢DD, 𑌣DH, 𑌤DDH, 𑌥N, 𑌦NN, 𑌧NH,;

𑌨P, 𑌩PH, 𑌪B, 𑌫BH, 𑌬M, 𑌭MH,;

𑌮R, 𑌯RH, 𑌰L, 𑌱LH,;

𑌲S, 𑌳SH, 𑌴SS, 𑌵H.

Code Point	Character	Character name
XX18	𑌑	RANJANA LETTER K
XX19	𑌒	RANJANA LETTER KH
XX1A	𑌓	RANJANA LETTER G

XX1B	𑖧	RANJANA LETTER GH
XX1C	𑖨	RANJANA LETTER NG
XX1D	𑖩	RANJANA LETTER NGH
XX1E	𑖪	RANJANA LETTER C
XX1F	𑖫	RANJANA LETTER CH
XX20	𑖬	RANJANA LETTER J
XX21	𑖭	RANJANA LETTER JH
XX22	𑖮	RANJANA LETTER NJ
XX23	𑖯	RANJANA LETTER NJH
XX24	𑖰	RANJANA LETTER T
XX25	𑖱	RANJANA LETTER TT
XX26	𑖲	RANJANA LETTER TH
XX27	𑖳	RANJANA LETTER TTH
XX28	𑖴	RANJANA LETTER D
XX29	𑖵	RANJANA LETTER DD
XX2A	𑖶	RANJANA LETTER DH
XX2B	𑖷	RANJANA LETTER DDH
XX2C	𑖸	RANJANA LETTER N
XX2D	𑖹	RANJANA LETTER NN
XX2E	𑖺	RANJANA LETTER NH
XX2F	𑖻	RANJANA LETTER P
XX30	𑖼	RANJANA LETTER PH
XX31	𑖽	RANJANA LETTER B

XX32	𑖦	RANJANA LETTER BH
XX33	𑖧	RANJANA LETTER M
XX34	𑖨	RANJANA LETTER MH
XX36	𑖪	RANJANA LETTER R
XX37	𑖫	RANJANA LETTER RH
XX38	𑖬	RANJANA LETTER L
XX39	𑖭	RANJANA LETTER LH
XX3B	𑖮	RANJANA LETTER S
XX3C	𑖯	RANJANA LETTER SH
XX3D	𑖰	RANJANA LETTER SS
XX3E	𑖱	RANJANA LETTER H

2.3 Semivowels

Semivowels 𑖲Y and 𑖳W in the UCS chart are the characters without a vowel /𑖴A/. All consonants are combined with semivowels to form monosyllabic characters.

Consonant /𑖵K/ with a semivowel /𑖲Y/ is a monosyllabic character represented by a cluster /𑖶KY(grind)/. Consonant /𑖷KH/ with a semivowel /𑖳W/ is a monosyllabic character represented by a cluster /𑖸KHW(cry)/.

Code Point	Character	Character name
XX35	𑖲	RANJANA LETTER Y
XX3A	𑖳	RANJANA LETTER W

2.4 Punctuation Marks

Line breaking symbols/ TWAATHALAA/ and end of a sentence are marked by a broken vertical line and a single vertical line respectively. The mark is /|. The multiple use of the same character is very common in Ranjana script. Double marks /|| represents a stop. The interpretation is different as per their use. For example a word written in between double characters /|| like /||ॐ|| is interpreted as the end of 5th verse. The interpretation varies depending on the users.

The punctuation mark / / is known as TUTISALAA in Newaa community. The traditional use of the character is to place it in-between characters as a word separator (ॐK ॐKH).

The character has found two more ways of its uses. First use is to change a character into a consonant and second is to turn a character into a vowel.

The following characters (ॐK, ॐKH, गG, ङGH, ङNG, ङHNGH, चC, चCH, जJ, यJH, गNJ, ङH NJH,;

ता, दTT, बाTH, ॐTTH, दD, डDD, धDH, ङDDH, नN, ॐNN, ङNH,; यP, दAPH, बB, नBH, मM, ङMH,; ॐR, ॐRH, लL, ॐLH, सS, ङSH, यSS, दH) are changed into consonants when the mark / / is placed .

For example, a character /ॐK/ with the mark / / is /ॐK/ (interpreted as a consonant).

The mark / / is used to turn a character /यY/ into a vowel /ॐE/.

For example, a character /यY/ with the mark / / is /यY/ (recognized as a vowel /ॐE/).

Code Point	Character	Character name
XX3F		RANJANA LETTER MARK TUTISALAA
XX4A	˘	RANJANA LETTER TWAATHALAA
XX4B		RANJANA LETTER DIPU

2.5 Numerals

Ranjana script has its own numeric characters from zero to nine.

The numerals are: ௐZero, ௑One, ௒Two, ௓Three, ௔Four, ௕Five, ௖Six, ௗSeven, ௘Eight and ௙Nine.

Code Point	Character	Character name
XX40	ௐ	RANJANA DIGIT 0
XX41	௑	RANJANA DIGIT 1
XX42	௒	RANJANA DIGIT 2
XX43	௓	RANJANA DIGIT 3
XX44	௔	RANJANA DIGIT 4
XX45	௕	RANJANA DIGIT 5
XX46	௖	RANJANA DIGIT 6
XX47	ௗ	RANJANA DIGIT 7
XX48	௘	RANJANA DIGIT 8
XX49	௙	RANJANA DIGIT 9

2.6 Symbol

The Symbol XX4C is introduced to form other symbols. With the combination of characters, other different symbols will be reproduced as glyphs.

Code Point	Character	Character name
XX4C		RANJANA LETTER SYMBOL HAKSSAMALAWARAYA

2.7 Collation order

The collation order is arranged as per the modern requirement of the user community. The precedence order of characters are as presented in the UCS chart. The prime order of characters is :

ௐA<௑A:<௑A<௑A:<௑AA<௑AA:<௑AA<௑AA:<௑A:<௑A:<௑A:<௑A:<௑U<௑U:<௑U<௑U;
 <௑E<௑E:<௑E<௑E:<௑O<௑O:<௑O<௑O;
 <௑K<௑KH<௑G<௑GH<௑NG<௑NGH<௑C<௑CH<௑J<௑JH<௑NJ<௑NJH;
 <௑T<௑TT<௑TH<௑TTH<௑D<௑DD<௑DH<௑DDH<௑N<௑NN<௑NH;
 <௑P<௑PH<௑B<௑BH<௑M<௑MH<௑Y<௑R<௑RH<௑L<௑LH<௑W<௑S<௑SH<௑SS<௑H.

3 Rendering the Ranjana Script

The atomic characters presented in Universal Character Set(UCS) are indispensable for the representation of the Ranjana script. With the help of Ranjana-Non-Space-Joiner(RNSJ) and Ranjan-Space-Joiner(RSJ), the atomic characters are rendered to construct the required characters known as glyphs. RNSJ and RSJ are also used to represent symbols.

It should be noted that clusters are the characters vertically stacked. The vertical space provided by a font is limited. Therefore the representation of multiple characters as a glyph is limited. The possibility of number of characters used for stacking together are limited by a font. Two to three characters are presented as a cluster and characters not supported are presented as they are.

Ranjana- Non-Space-Joiner(RNSJ) joins two characters in between. The character so formed is represented by a glyph. A Ranjana-Space-Joiner(RSJ) is used where multiple representation of combined characters are possible.

For example:

The combination of characters /𑀓R/ and /𑀕/ are represented by two different glyphs. They are separated by the use of RNSJ and RSJ.

/𑀓R/+RNSJ+/𑀕/= /𑀓𑀕R/

/𑀓R/+RSJ +/𑀕/= /𑀓𑀕R/

Rendering Ranjana script with Ranjana-Non-Space-Joiner(RNSJ) and Ranjana-Space-Joiner(RSJ)

The rules are :

Rule number one :

3.1 If a Ranjana-Non-Space-Joiner or a Ranjana-Space-Joiner is placed in between characters then the characters are represented by a single glyph.

Ranjana-Non-Space-Joiner is used for representation of consonant clusters and ligatures. Ranjana-Space-Joiner is used in special cases where dual representation is possible.

Two glyphs /𑀓𑀕KSS/ and /𑀓𑀕JNJ/ are commonly used in manuscripts. They are recognized as ligatures. Character /𑀓𑀕KSS/ is a ligature of /𑀓𑀕K/ and /𑀕SS/, and /𑀓𑀕JNJ/ is a ligature of two characters /𑀓𑀕J/ and /𑀕JNJ/. Both the ligatures have equivalent clusters. The dual representation of two characters are separated by the use of NSJ and SJ.

The examples are follows:

- 1- The case of characters /𑀓𑀕K/ and /𑀕SS/

/𑀓𑀕K/ +NSJ+ /𑀕SS/= /𑀓𑀕KSS/ - cluster

/𑀓𑀕K/ +SJ+ /𑀕SS/= /𑀓𑀕KSS/ - a ligature

- 2- A case of characters /𑀓𑀕J/ and /𑀕JNJ/

/𑀓𑀕J/ +NSJ+ /𑀕JNJ/ = /𑀓𑀕JJYN/ (a cluster)

/𑀓𑀕J/ +SJ+ /𑀕JNJ/ = /𑀓𑀕JNJ/ - a ligature

The glyph /𑀓𑀕KSS/ is a part of a goddess name लक्ष्मी LAKSSMI.

The ligature /𑀓𑀕JNJ/ is a part of a word ज्ञान JNJAAN/ knowledge.

3-A case of two vowels

Diphthong vowels, /AI/ and /AU/ are commonly used with consonants. They do not have alternative representations. Therefore they are represented by their respective atomic characters with NSJ in between the two characters.

For example:

/A/ + NSJ+ /AI/ = /AI/

/A/ + NSJ+ /AU/ = /AU/ .

4-The Symbols

Character /XX4B/ along with other characters and a RNSJ in between is selected for the representation of different symbols.

/XX4B/ + RNSJ+ /K/ = /Symbol XX4BM(OM)/.

/XX4B/ + RNSJ+ /KH/ = /Symbol XX4BKH/ - a symbol used to represent a long sound with a stop.

3.2 Rule number two :

If a Non-Space-Joiner or Space-Joiner is placed in between a glyph and a character , then the glyph and a character are represented by a new glyph.

Glyph/KW/ is a representation of two atomic characters with NSJ(/K/, NSJ and /W/) in between.

/KW/ + NSJ+ /A/ = /KWA/. The new glyph represents a glyph and a character.

Glyph/LHW, Vomit/ is a representation of two atomic characters with NSJ(/LH/, NSJ and /W/) in between.

/LHW, Vomit/+ NSJ+ /A/ = /LHWA, Lift/. The new glyph represents a glyph and a character.

/LHW, Vomit/+ NSJ+ /A:/ = /LHWA, fat person/. The new glyph represents a glyph and a character.

3.3 Rule number three :

Only predefined glyphs will be represented when Non-SpaceRanjana-Joiner or Ranjana-Space-Joiner are used in between characters.

The glyphs like /NTR/, /SSSTRAA/ represent multiple characters. Not all the multiple characters are pre-defined. For example multiple characters of /KKK/ is not required and not supported for making a cluster. Non supported characters are left alone as if RNSJ or RSJ are not used.

For example:

The supported multiple characters like /NTRAA/, /SSTRA/ are in use and supported by regular fonts.

/N/ + NSJ+ /T/ + NSJ+ /R/ = /NTR/

/SS/ + NSJ+ /T/ + NSJ+ /R/ + NSJ+ /AA/ = /SSSTR/

The non supported clusters like triple /K/ will be /K/ and /KK/.

/K/ + NSJ+ /K/ = /KK/

The cluster will be broken into character with a /TUTISALE/ and the last two characters will be joined as a cluster. /KK/ + NSJ+ /K/ = /KKK/

4 Building characters from UCS

The atomic characters in UCS chart are combined to make a alphasyllabic character, cluster or a ligature depending on the nature of their use. The changes occur in a character after the combination of consonant and vowel are presented in the Table-2. This change occurs with each and every character when joined with another character. Depending on the character's structure, building of a glyph are presented. The combination of characters are divided into three groups, one as CV(consonant-vowel), CC(consonant-consonant) and CCV(consonant-consonant-vowel).

Table-2 presents the possible combination of a consonant and a vowel.

Whenever a character is combined with another character, the characters are represented by a new glyphs.

The pictorial change in the shape of one atomic character /𑂔K/ is presented in Table 1.

A consonant (atomic character) /𑂔K/ with a Ranjana-Non-Space-Joiner and a vowel /𑂔AA/ are represented by a glyph /𑂔KAA/.

Table 2- An atomic character 𑂔K and with other 24 atomic characters (vowels) as glyphs.

UCS character 𑂔K			
with a prime Vowel-a glyph	with a long Vowel-a glyph	with a nasalized Vowel –a glyph	with a long nasalized Vowel –a glyph
𑂔K 𑂔A-𑂔KA	𑂔K 𑂔A:-𑂔KA: (solid from mixture)	𑂔K 𑂔AF -𑂔KA (tell !)	𑂔K 𑂔AF: -𑂔KA: (spike)
𑂔K 𑂔AA-𑂔KAA (take !)	𑂔K 𑂔AA:-𑂔KAA: (do take)	𑂔K 𑂔AAF-𑂔KAA	𑂔K 𑂔AAF:-𑂔KAA: (blind)
𑂔K 𑂔I-𑂔KI	𑂔K 𑂔I: -𑂔KI: (insect, obstacle)	𑂔K 𑂔IF-𑂔KI	𑂔K 𑂔IF: -𑂔KI:
𑂔K 𑂔U-𑂔KU (carrying unit)	𑂔K 𑂔U: -𑂔KU: (field digger)	𑂔K 𑂔UF-𑂔KU (smoke)	𑂔K 𑂔UF: -𑂔KU: (corner, by smoke)
𑂔K 𑂔E-𑂔KE	𑂔K 𑂔E:-𑂔KE:	𑂔K 𑂔EF-𑂔KE (pulse)	𑂔K 𑂔EF: -𑂔KE: (by the pulse)
𑂔K 𑂔O-𑂔KO	𑂔K 𑂔O:-𑂔KO: (crow)	𑂔K 𑂔OF-𑂔KO (younger)	𑂔K 𑂔OF: -𑂔KO: (from down)

The structure of an atomic character /𑂔K/ change into the following shapes

𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔 𑂔𑂔

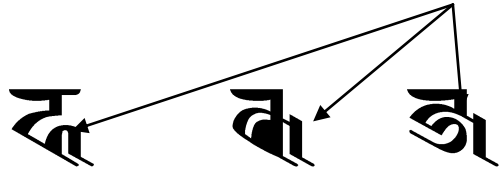
by retaining its basic look in a syllable after the application of different forms of six vowels. This is true with other characters also. Characters are grouped for similar changes by their structural forms.

4.1 Combination of a consonat and a vowel /𑂔AA/:

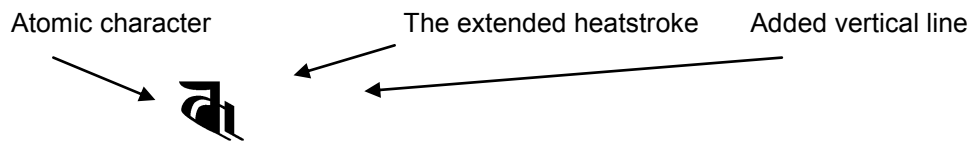
4.1.1 Consonants with right hand extension in the shape are 𑂔K, 𑂔J and 𑂔H.

The atomic characters are selected in different groups. The groups are made as per the shape of characters.

The first group of characters similar in shape at the right hand part are shown by an arrow. A small half vertical line is added to change the character into a syllable with a vowel /ॐAA/.

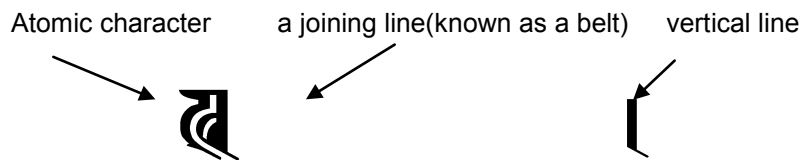


Head stroke is extended to match the right hand part and a vertical line is drawn from top of the character at the right hand part of a character without joining the right hand part.



/𑂕KAA/, /𑂖JAA/, 𑂔/HAA/ .

4.1.2 The eight characters are categorized under head stroke group. They are changed by the addition of a slanted joining line followed by a vertical line.



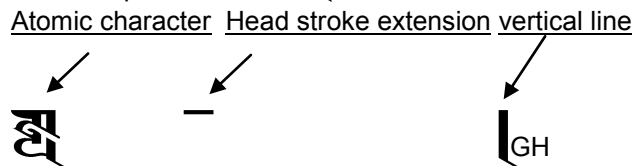
/𑂔KHA, 𑂕GAA, 𑂖NJAA, 𑂗THAA, 𑂘TTHAA, 𑂙DHAA, 𑂚NNAA and

𑂛SHAA/.

4.1.3 The remaining characters with a a vowel/ॐAA/.

All the other consonants with a /ॐAA/ vowel have a head stroke extended line and a vertical line.

For example : Character 𑂧GH



The glyphs of atomic characters with a vowel /**आ**/ are :

/**अ** AA/, /**इ** AA/, /**ए** AA/, /**ओ** AA/, /**उ** AA/, /**ऋ** AA/, /**ॠ** AA/, /**ऌ** AA/, /**ॡ** AA/, /**ऋ** AA/, /**ॠ** AA/, /**ऌ** AA/, /**ॡ** AA/, /**ऋ** AA/, /**ॠ** AA/, /**ऌ** AA/, /**ॡ** AA/, /**ऋ** AA/, /**ॠ** AA/, /**ऌ** AA/, /**ॡ** AA/

4.2 Combination with a vowel /**ऋ**/:

Consonants are added with a vertical line in front and a semi curve at the top of a character.
For example:

Atomic character vertical line a semi curve line



The characters with a vowel /**ऋ**/ are :

/**क** KI/, /**ख** KHI/, /**ग** GI/, /**घ** GHI/, /**ङ** NGI/, /**ञ** NGHI/, /**च** CI/, /**छ** CHI/, /**ज** JI/, /**झ** JHI/, /**ण** NJI /, /**ट** TI/, /**ठ** TTI/, /**ड** THI/, /**ड** THI/, /**ड** DI/, /**ड** DDI/, /**ड** DHII/, /**न** KI/, /**न** NNI/, /**न** NHII/, /**प** PI/, /**प** PHII/, /**ब** BI/, /**भ** BHI/, /**म** MI/, /**य** MHI/, /**य** YI/, /**र** RI/, /**र** RHI/, /**ल** LI/, /**ल** LHI/, /**व** WI/, /**स** SI/, /**स** SHI/, /**ह** HI.

4.3 Combination with a vowel /**उ**/:

Three different symbols are added to atomic characters depending on characters.

Two symbols are in use for vowel /**उ**/ . They are the followings: /**ॣ** , **।**/. The third is used with a character /**व**R/.

The small curve line is added at the bottom of a character.

Atomic character added symbol



4.3.1 Consonants like K,G,CH, CHH,T,TH, N,NH,P,PHB,BH,MU,MH,Y,L,W,S,SS,SH have U vowel similar to K. They are :

क KU, **ग** GU, **च** CHU, **घ** GHU, **त** TU, **थ** THU, **द** DU, **न** NHU, **प** PU, **ब** BU, **भ** BHU, **म** MU, **य** MHU, **य** YU, **ल** LU, **व** WU, **स** SU, **स** SSU, **श** SHU.

4.3.2 Consonants like KH,NG,J,JH,NJ,TTH,DD,DDH,NN have different type of U vowel mark.

Atomic character added symbol



they are : **क** KHU, **ङ** NGU, **ज** JU, **झ** JHU, **ण** NJU, **ट** DHU, **ठ** TTHU, **ड** DDU, **ड** DDHU and **न** NNU.

The character /**𑂔r**/ is a newly added character adopted by the Newaa community. Therefore the character /**𑂔R**/ with a vowel /**𑂢u**/ is represented by the addition right hand extension.

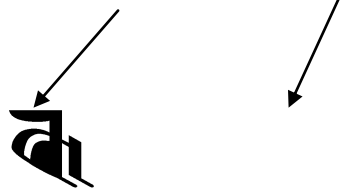
Consonant/ **𑂔R**/ with vowel /**𑂢u**/ is represented by a glyph **𑂔RU**.

4.4 Combination with a vowel /**𑂔e**/:

A small curve is added in front of a character to represent a syllable.

For example, a small curve mark is added to a character /**𑂔K**/ to form a glyph / **𑂔KE**/.

Atomic character front curve line



4.4.1 The following Consonants and a vowel /**𑂔e**/ are represented by a glyphs. And they are:

/ **𑂔**KE/, / **𑂔**GHE/, / **𑂔**NGE/, / **𑂔**NGHE/, / **𑂔**CE/, / **𑂔**CHE/, / **𑂔**JE/, / **𑂔**JHE/, / **𑂔**

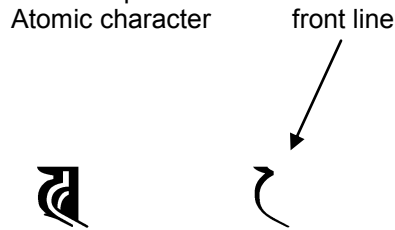
NJE/, / **𑂔**NJHE/, / **𑂔**TE/, / **𑂔**TTE/, / **𑂔**DE/, / **𑂔**DDE/, / **𑂔**NNE/, / **𑂔**NE/, / **𑂔**NE/, /

𑂔PE/, / **𑂔**PHE/, / **𑂔**BE/, / **𑂔**BHE/, / **𑂔**ME/, / **𑂔**MHE/, / **𑂔**YE/, / **𑂔**RE/, / **𑂔**RHE/,

/ **𑂔**LE/, / **𑂔**LHE/, / **𑂔**WE/, / **𑂔**SE/, / **𑂔**SSE/, / **𑂔**HE/

4.4.2 The eight non-head stroke characters are presented as alphasyllabic characters with a vowel /**ꣳ**e/ will have a long curve line added in front of the atomic character.

For example :

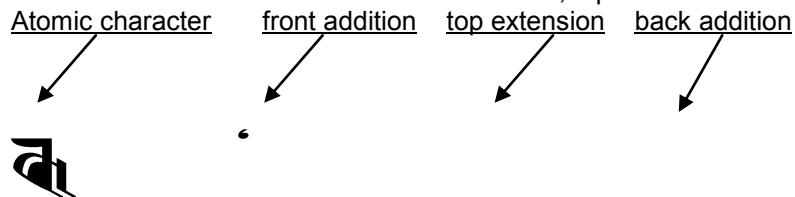


The eight characters are:

ꣳKHE, **ꣳ**GE, **ꣳ**NJE, **ꣳ**THE, **ꣳ**THE, **ꣳ**DHE, **ꣳ**NNE and **ꣳ**SHE.

4.5 Consonants with a vowel /**ꣳ**o/:

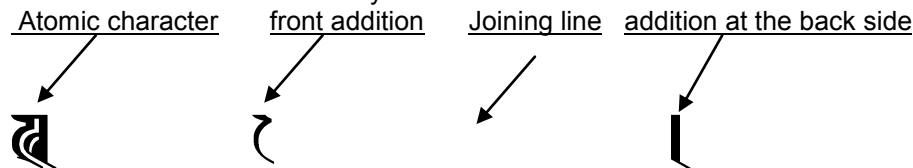
Atomic characters are added with lines at front, top and back of their major shape.



4.5.1 The above changes are applicable only to atomic characters /**ꣳ**K/, /**ꣳ**J/, and /**ꣳ**H/. The glyphs are:

ꣳ/KO/, **ꣳ**/JO/, **ꣳ**/HO/

4.5.2 The changes in eight characters under head stroke rule after addition of /**ꣳ**O/ vowel are different from the other characters. They are:



The above changes are applicable only to the atomic characters **ꣳ**KH, **ꣳ**G, **ꣳ**NJ, **ꣳ**TH, **ꣳ**TTH, **ꣳ**DH, **ꣳ**NN and **ꣳ**SH when they are represented with /**ꣳ**o/ vowel. The glyphs are:

ꣳ/KHO/, **ꣳ**/GO/, **ꣳ**/NJO/, **ꣳ**/THO/, **ꣳ**/TTHO/, **ꣳ**/DHO/, **ꣳ**/NNO/, **ꣳ**/SHO/

The remaining consonants with a /**ꣳ**o/ vowel as glyphs are :

ꣳ/GHO/, **ꣳ**NGO/**ꣳ**CHO/**ꣳ**CHO/**ꣳ**JHO/**ꣳ**TAO/**ꣳ**DO/**ꣳ**DO/**ꣳ**NNO/ **ꣳ**NNO/**ꣳ**PO/**ꣳ**PHO/**ꣳ**BO/**ꣳ**VO/**ꣳ**MO/**ꣳ**YO/**ꣳ**RO/**ꣳ**LO/**ꣳ**WO/**ꣳ**SO/**ꣳ**SSO/

4.6 Multiple consonants with a vowel : A glyph

Multiple consonants are merged to form a single character(cluster or ligature). The character will have the properties of upper character if any of the vowels /**𑒪**E/ or /**𑒪**AA/ or /**𑒪**O/ is merged with it. For example with the merged characters:

1-If upper character is a head stroke character/**𑒪**N/ and lower character is a non- head Stroke character /**𑒪**DH/ and if both the characters are merged with a vowel /**𑒪**AA/, /**𑒪**E/ or /**𑒪**O/, a single character /**𑒪**NDHAA/, /**𑒪**NDHE/ or /**𑒪**NDHO/ is formed respectively as a head stroke character.

1-If upper character is a non-head stroke character/**𑒪**DH/ and lower character is a head Stroke character/**𑒪**W/ and if both the characters are merged with a vowel /**𑒪**AA/, /**𑒪**E/ or /**𑒪**O/, a single character /**𑒪**DHWAA/, /**𑒪**DHWE/ or /**𑒪**DHWO/ is formed respectively as a non-head stroke character.

5 Acknowledgement

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5 References

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3. Lipi Thapu Guthi, 2000, Ranjana Prachalit and Bhujimol, Lipi Thapu Guthi.

UNIVERSAL CHARACTER SET						RANJANA
	XXX0	XXX1	XXX2	XXX3	XXX4	XXX5
0	𑀀 XXX00	𑀁 XXX10	𑀂 XXX20	𑀃 XXX30	𑀄 XXX40	
1	𑀅 XXX01	𑀆 XXX11	𑀇 XXX21	𑀈 XXX31	𑀉 XXX41	
2	𑀊 XXX02	𑀋 XXX12	𑀌 XXX22	𑀍 XXX32	𑀎 XXX42	
3	𑀏 XXX03	𑀐 XXX13	𑀑 XXX23	𑀒 XXX33	𑀓 XXX43	
4	𑀔 XXX04	𑀕 XXX14	𑀖 XXX24	𑀗 XXX34	𑀘 XXX44	
5	𑀙 XXX05	𑀚 XXX15	𑀛 XXX25	𑀜 XXX35	𑀝 XXX45	
6	𑀞 XXX06	𑀟 XXX16	𑀠 XXX26	𑀡 XXX36	𑀢 XXX46	
7	𑀣 XXX07	𑀤 XXX17	𑀥 XXX27	𑀦 XXX37	𑀧 XXX47	
8	𑀨 XXX08	𑀩 XXX18	𑀪 XXX28	𑀫 XXX38	𑀬 XXX48	
9	𑀭 XXX09	𑀮 XXX19	𑀯 XXX29	𑀰 XXX39	𑀱 XXX49	
A	𑀲 XXX0A	𑀳 XXX1A	𑀴 XXX2A	𑀵 XXX3A	𑀶 XXX4A	
B	𑀷 XXX0B	𑀸 XXX1B	𑀹 XXX2B	𑀺 XXX3B	𑀻 XXX4B	
C	𑀼 XXX0C	𑀽 XXX1C	𑀾 XXX2C	𑀿 XXX3C	 XXX4C	
D	𑁀 XXX0D	𑁁 XXX1D	𑁂 XXX2D	𑁃 XXX3D		
E	𑁄 XXX0E	𑁅 XXX1E	𑁆 XXX2E	𑁇 XXX3E		
F	𑁈 XXX0F	𑁉 XXX1F	𑁊 XXX2F	𑁋 XXX3F		

Annex-I Requesters' reference

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Nepaalabhaasaa (Alphabetic Book)

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Annex-II Ranjana script on display



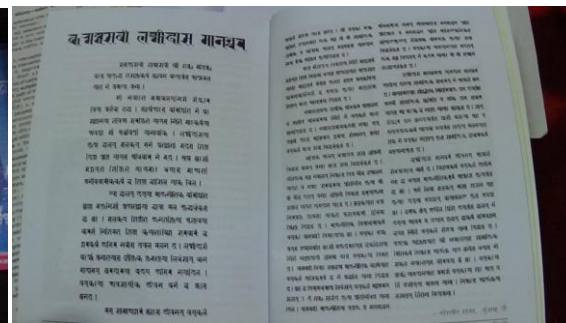
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Chwasapasa Building



Books on Display



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