L2/16-342

TO: **UTC**
FROM: **Deborah Anderson, Ken Whistler, Roozbeh Pournader, Andrew Glass, and Laurentiu Iancu**
SUBJECT: **Recommendations to UTC #149 November 2016 on Script Proposals**
DATE: **4 November 2016**

The script ad hoc group met on 28 October 2016 in order to review proposals. The following represents feedback on proposals that were posted in the Unicode document registry at the time the group met.

NORTH AMERICA
1. Mayan
Document: L2/16-264 Mayan Numerals – Quinn

Discussion: We reviewed this document, which proposes 20 Mayan numerical characters. The numerals appear in modern usage, such as on Guatemalan banknotes and as page numbers in publications about Mayan.

The proposed numerals, 0 to 19, have a horizontal-bar orientation that is written top-to-bottom, and a vertical form, written left-to-right. The horizontal-bar form has been chosen as the default, as it is most commonly found in modern texts.

For numbers above 19, Mayan uses a positional system of stacking by powers of 20. This proposal proposes the numbers 0 through 19 as atomic units, but leaves stacking of these units to other mechanisms, because grouping for stacking would require use of a higher-level protocol.

The following points were noted:

- We recommend the characters be located in a new block of two columns, from 1D2E0..1D2FF.
- The suggestion (p. 6) of adding a "Vigesimal_Digit=yes" property is not feasible, so the General Category (gc) should be No, not Nd. Hence, the gc properties for 1 should be: [codepoint];MAYAN NUMBER ONE;No;;L;;;;1;N;;;;
- Stacking should not be done within the units 1-19; higher-level protocols should be used to handle vertical stacking to represent the positional system (for powers of 20).
- We suggest making the vertical orientation "U", so if text is changed to a vertical orientation, the number won't rotate (see UTR #50 Unicode Vertical Text Layout).
- We recommend the proposal author provide explicit examples of numbers above 19 to demonstrate stacking (such as the higher numbers on bank notes, and "5124" described on http://gwydir.demon.co.uk/jo/numbers/maya/)
- The author might note that CSS has a writing mode that can be used to specify the vertical versus horizontal layout of text.
- The numbers also appear in the codices, but we don't foresee a problem in encoding them at this time.

Recommendations: We recommend the UTC discuss the proposal and approve these characters, but request an updated proposal from the author, with code points and properties adjusted as described above.

SOUTH ASIA
2. *Tigalari (Tulu)*
Document: L2/16-241 Preliminary proposal to encode Tigalari script – Murthy

Discussion: We reviewed this extensive, carefully-researched preliminary proposal.

The following summarizes the points raised during discussion:

- The proposal recommends the script use the academic name, "Tigalari" over "Tulu". In our opinion, the academic name is suitable, and we recommend that the designation in the Roadmap be changed from "Tulu" accordingly.
- The diphthongs should be handled as units without formal decompositions. A table, similar to Table 12-30 for Malayalam in *The Unicode Standard 9.0* (*TUS*), should be included in the proposal. (Hence, remove the decomposition information on pages 6 and 7.)
- To handle representation of vocalic L and vocalic LL, the situation in Bengali (§12.2 in *TUS*, p. 467ff.) may be used as a guide. In Bengali, a font implementation can choose whether the ligature of the C + vowel combination is the default. If the non-ligated form is the default, then ZWJ can be used as a hint to request the ligature form. If the ligated form is the default for a font implementation, then ZWNJ can be used to block the ligature (see figures 12-11 and 12-12 in *TUS*). The post-base form does not require a ZWNJ, but should be encoded as an independent vowel.
- Provide a full list of the ligature forms occurring with virama, and identify the default shape. Are there only four (K, T, TT, and N), or is there evidence for more (as suggested in footnote 18 on page 13)? Depending upon the answer, chillus may need to be encoded.
- In the example on the top of page 14, the first ZWNJ is not needed:

- Section 5.5 mentions that conjuncts can be formed horizontally or vertically. Do the two orientations need to be differentiated? If so, sequences with ZWJ or ZWNJ could be used, as in Malayalam.
- Section 8 "Other / Punctuations / Symbols" mixes together character function with a listing of characters. We suggest re-organizing this section into the different graphical elements (and not function).
    - Include a section on "pushpika" (instead of listing it by the function "period"), and describe how it is used. Adjust the text in §6.1 (p. 18) and names list accordingly, so "pushpika" refers to the graphical symbol, and not a function.
    - Create a new section for flower mark describing its use, and note that to represent it in text, FLOWER PUNCTUATION MARK (U+2055) should be employed.
    - Create a section on "dandas" and note that the Devanagari dandas should be used in Tigalari (unless the author feels a case can be made for script-specific dandas).
- In section 10.1 "Collation", note that the collation should be modelled on Tamil Grantha, but comment on anything unusual (i.e., if the standard collation for Tigalari varies from the usual Brahmic default collation).
- In section 10.2 "Character Properties", follow the properties based on one of Anshuman Pandey's Indic script proposals.

- Section 7 "Digits" notes that Kannada digits are commonly used. A new section on "Script Extensions" should be added to the proposal, asking that the Kannada digits U+0CE6..U+0CEF should be extended for use with Tigalari.
- Section 8.6 "Candrabindu" should probably be separately encoded. As a result, modify the text on the top of page 24.
- The names list on pages 27 and 29 should probably include the characters for the Dravidian vowels, E and O.
- In answer to the question on page 68 about the number of empty cells required for additional characters: At the moment, the current block can stand as allocated on the Roadmap (six columns), but the block could be expanded to eight, if needed. If chillus are encoded, seven columns may be needed. If the block is extended, "Sharada extensions", currently assigned to the two columns U+113E0..U+113FF, should be moved.
- The ad hoc will need to examine more closely the correction mark (*tiddu*) (pp. 22-23) and the *reph* (p. 23) when reviewing the next version of the proposal.

Minor corrections:

- §5.2 The Vowel Signs Vocalic L and LL glyphs on the top of page 10 should be changed to: ◌ೣ and ◌ೡ
- §5.3 Change the name of the heading of the second column on pages 10 and 11 from "Post-Base Forms" to "Post-Base or Below-Base Forms"
- §8.7 Correct the spelling of Devanagari at the end of the last sentence.

Recommendations: We recommend the UTC review this proposal and send comments to the author, including those above, and invite a revision from the author.

3. Telugu

Document: L2/16-285 Proposal to encode the TELUGU SIGN COMBINING ANUSVARA ABOVE – Srinidhi and Sridatta

Discussion: We reviewed this document, which proposed encoding one character. Solid evidence is provided showing contrastive use of the "regular" ansuvara and the combining anusvara.

Recommendations: We recommend the Unicode Technical Committee accept U+0C04 TELUGU SIGN COMBINING ANUSVARA ABOVE, and remand to the Editorial Committee the proposal's suggestions on annotations (in §4) for the names list and the core specification.

4. Gurmukhi

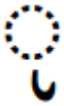
Documents:

L2/16-294 Changes to Gurmukhi 10 – Singh

L2/16-302 Feedback on L2/16-294 on Gurmukhi – Sharma

Discussion: We reviewed these two documents on Gurmukhi. The "Changes to Gurmukhi 10" requests: (1) a glyph change for one Gurmukhi character (U+0A75), (2) the encoding of a new character for post-base YA, and a change to the sequence VIRAMA + YA.

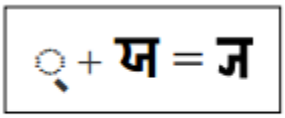
(1) The character U+0A75 YAKASH was added in Unicode 5.1, based upon L2/06-037, which only included one example of the character, which was a hook. The current glyph has a rounded hook shape, whereas the proposed shape contains a horizontal bar on the right:

Current:  Proposed: 

The proposed shape is attested in recent print examples on pages 2-4, and seems to be well-justified. (Its shape seems to derive from the center portion of a subjoined GURMUKHI LETTER YA.)

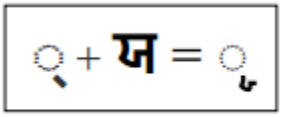
(2) The proposal requests the separate encoding of ਜ GURMUKHI LETTER YYA (=post-base YA), and suggests a change the handling of the sequence of VIRAMA + YA (U+0A2F) as follows:

Current:



Virama (U+0A4D) + Ya (U+0A2F) = Post-base form of Ya (Modern)

Proposed:



Virama (U+0A4D) + Ya (U+0A2F) = GURMUKHI SIGN YAKASH

Because this would change the model, it is not to be recommended. As noted by Sharma in L2/16-302, data has likely already been encoded with U+0A75 YAKASH and use of VIRAMA + YA for post-base YA.

Recommendations: We recommend the UTC discuss this document, and approve the glyph change, which reflects the change in current typography. We do not recommend accepting the new character or the other change, since it would break the current model.

5. Chakma

A. Document: L2/16-303 Request to change the Indic Shaping Property for U+11134 – Glass and Chakma

Discussion: We reviewed this document, which requests changing the Indic Syllabic Property for U+11134 CHAKMA MAAYYAA from Pure_Killer to Gemination_Mark. Historically the character is the same as a virama.

The Indic Syllabic property for this character, Pure_Killer, does not allow it to combine with a vowel in the Universal Shaping Engine. Besides being a vowel killer, the character also combines with a vowel to indicate gemination after a consonant.

In our view, the proposed change means that the Indic Syllabic property is driving the shaping. The use of this character is said to be about 50% as a killer, and 50% as a gemination mark; it is the normal killer but is also usable on vowels. A better approach for implementations that use the Indic Properties for text layout would be to hard-code an override for the character property in the shaping engine, relax the regular expression that defines Indic syllables in the engine, and/or change the Universal Shaping Engine specifications in other appropriate ways. (This is already the case for various other Indic characters that behave differently from the most common character types.)

Recommendations: We recommend the UTC review this document, but not accept the proposed change. Instead, we suggest the UTC remand to the Editorial Committee an annotation for U+11134, indicating its use as a gemination mark. We encourage implementers handle it as an override in the Universal Shaping Engine.

B. Document: L2/16-330 Proposal to encode CHAKMA LETTER LHAA, DEPENDENT VOWEL SIGNS AA & EI for Chakma – Chakma and Glass

Discussion: We reviewed this proposal, which requested one letter and two vowel signs for Chakma needed to represent the Baarah Maatraa orthography of Chakma. The proposal includes well-supported evidence: recent primers, a government-approved textbook, and a manuscript showing use of the two vowel signs. The vowel signs have no independent forms.

Recommendations: We recommend the UTC approve the three characters:
11144 CHAKMA LETTER LHAA
11145 CHAKMA VOWEL SIGN AA
11146 CHAKMA VOWEL SIGN EI.
Because they are urgently needed, we recommend them for inclusion in Unicode 11.0.

MIDDLE EAST
6. Al-Dani Quranic Marks
Document: **L2/16-268 Suggestions on some Al-Dani Quranic Marks proposition – Lazrek**

Background documents:
L2/16-156 Recommendations to UTC #147 May 2016 on Script Proposals – Anderson et al.
L2/16-102 Consolidated Comments by Mansour, Evans, and Abudena on Al-Dani Quranic Marks – Anderson
L2/16-100 Comments on L2/16-056 Proposal to encode AlDani Quranic Marks – Abudena
L2/16-056 Proposal to encode Al-Dani Quranic marks used in Quran published in Libya – Lateef Sagar Shaikh
L2/16-044 Proposal to encode Quranic marks used in Quran published in Libya with Commentary – Abudena

Discussion: We reviewed this document, which provided useful feedback on the earlier set of recommendations by the script ad hoc (**L2/16-156)** and accompanying documents.

The following is a summary of the discussion:

Table 1 "New marks suggested to be encoded"

- Of the proposed characters in Table 1, we noted that one character has already been accepted: ARABIC SMALL LOW WAW.
- The second character in the table needs a name. The proposed names ARABIC SIGN WAQF or ARABIC STOP SIGN are very general; a more suitable name would be one that describes the character visually. Three possible alternatives to run by the interested parties would be:
    - ARABIC SMALL HEAD OF SAD
    - ARABIC SMALL SAD INITIAL FORM
    - ARABIC LARGE WASLA ABOVE

  Whatever name is decided, "SIGN OF WAQF" should be included as an annotation in the names list.

Table 2 "New marks suggested to be encoded"

- Does ◌ى always take a FATHA above it? Cf. ◌ىَ and ◌ٰ.

  Interested parties need to provide more examples of this character (with and without a FATHA). Useful evidence might come from a guide to Al-Dani texts or a comparison between the orthography of various Quranic texts.

Table 4 "Alternative calligraphic marks choice"

- Of the characters in Table 4, the first character, ◌ٜ, is probably needed. More information is required.

Other

- One topic not mentioned in L2/16-268 , but listed in the ad hoc recommendations (L2/16-156), involve the solid dots and circles, as in the examples of ARABIC ALTERNATE ALEF WASLA:

  Additional information is needed to properly evaluate the dots and circles.

Recommendations: We recommend interested parties review this document and provide feedback to Lorna Evans and Deborah Anderson.

7. Proto-Cuneiform
Document: L2/16-267 Preliminary proposal to encode Proto-Cuneiform in the SMP (WG2 N4760) – Everson

Discussion: We reviewed this preliminary proposal for Proto-Cuneiform.

Questions raised during discussion:

- How does this list, presumably from CDLI, compare to Green and Nissen 1987? We recommend a mapping be made between CDLI and Green and Nissen, and a case be made which ones should be included (or not).
- What problem does the proposal aim to solve, since it only covers the 200 most frequent characters?
- Adjust the names and annotations for consistency (i.e., SHE-A NAM2 has an annotation "she-a.nam2" with a period between "a" and "nam2").

Recommendations: We recommend the UTC members review this proposal at their leisure, and forward comments to the proposal authors.

AFRICA
8. Egyptian Hieroglyphs
Document: L2/16-307 Towards an Expansion of the Unicode Hieroglyph repertoire – Richmond

***Related documents*:**
L2/16-257 Source analysis of an extended Egyptian Hieroglyphs repertoire (Hieroglyphica) – Suignard
L2/16-250 Preliminary proposal to encode Möller's Egyptian Hieroglyphs in the SMP (WG2 N4741) – Everson

Discussion: We reviewed this document, which recommends subsetting work on Egyptian Hieroglyphs into two tracks, one for Classical Egyptian ("Expansion A") and one for Ptolemaic Egyptian ("Expansion P"). The Classical Egyptian subset would follow "an evolution of the Gardiner Middle Egyptian focussed principles", presumably based on the naming conventions in the original proposal for the Gardiner set, L2/07-097 . Expansion A would also include hieroglyphs used for hieratic transcription, as proposed in L2/16-250. Ptolemaic Egyptian, on the other hand, would rely on the work done by Michel Suignard (L2/16-257).

While we laud the effort to engage the user community and the development of a tool to analyze MdC transcriptions, we do not feel such subsetting will necessarily "best meet the requirements of the user community in a timely fashion".

A few comments:

- The naming conventions in the proposal for the Gardiner set, L2/07-097, do not address how to handle the thousands of characters in the later period. In our view, a comprehensive approach that covers both Classical and Ptolemaic characters would be preferable. The discussion by Suignard in L2/16-257 addresses the problem of names and the taxonomy of the full range of characters, from the Gardiner set to Ptolemaic.
- Suignard presents in Annex B of L2/16-257 information for a database, which includes the sources. Inviting the user community to review the database entries and submit source information to a Unihan-like database would make the information available to the field (and the public) in an organized way. Those characters with sources would be eligible for encoding, if there is consensus from users to do so.
- The hieroglyphs for hieratic transcription are still undergoing review by the Altägyptische Kursivschriften group in Mainz, so any action on the preliminary proposal L2/16-250 is still premature.

Recommendations: We recommend the UTC review this document, but do not recommend UTC accept the approach advocated in this document.

EAST ASIA

9. Shui and Primitive Scripts

Documents: L2/16-263 Updated Proposal for encoding Shuishu in the SMP – China
L2/16-262 Preliminary Proposal for encoding Primitive Scripts in Southwest China in the SMP – Zhao

Discussion: We reviewed these documents quickly, and noted that they were discussed at the recent WG2 meeting. Feedback was relayed to the proposal authors during the WG2 meeting.

Recommendations: We recommend UTC members review these documents at their leisure, and send feedback to the proposal authors.

10. Small Khitan

Document: L2/16-296 Discussion of Cluster Formation in Khitan Small Script – West et al.

Background docs:

L2/16-156 Recommendations to UTC #147 May 2016 on Script Proposals – Anderson et al.
L2/16-245 Final proposal to encode the Small Khitan Script in the SMP (revised; WG2 N4738r2)
L2/16-271 Small Khitan code charts
L2/16-338 Small Khitan script ad-hoc report
L2/16-266 Comments on Mongolian, Small Khitan, and other WG2 #65 documents

Discussion: We reviewed this document, which proposes a change in the use of the format characters from the script ad hoc recommendations L2/16-156 (and cited in the WG2 Small Khitan ad-hoc report).

Khitan Small Script has a very regular, fixed format in its cluster-structure, and hence the authors of this document believe the format characters should *not* be modeled on those recently approved for Egyptian hieroglyphs.

WG2 had agreed:

- to encode two characters, KHITAN SMALL SCRIPT HORIZONTAL JOINER <*> and KHITAN SMALL SCRIPT VERTICAL JOINER <:>
- the cluster with A over BC over E would be represented by <A:B*C:E>
  the cluster AB over CD over E would be represented as <A*B:C*D:E>

This document takes a different approach:

- A single format character is used for each cluster:
  - KHITAN SMALL SCRIPT DOUBLE INITIAL CLUSTER MARKER (DICM) for clusters starting with two adjacent characters
  - KHITAN SMALL SCRIPT SINGLE INITIAL CLUSTER MARKER (SICM) for a cluster that starts with a single centered character.
- The format character would be placed in front of the first character in the cluster:
  - The cluster A over BC would be represented <SICM A B C>
    The cluster AB over CD over E would be represented <DICM A B C D E>
- A non Khitan Small Script character would signal the end of the cluster.

During discussion, the following points were raised:

- One of the criticisms of the current approach (as described in L2/16-156) is the burden on users, who would be expected to type a format character between each character. However, it was noted that an input method could be created to shield the user from having to type each format character.
- It was noted that complex scripts will not likely be usable if their shaping is not supported in the Universal Shaping Engine, since it is unlikely a script-specific shaping engine for Khitan Small Script will be developed.
- It would be useful for the UTC if the authors would explore alternative models.

Recommendations: We recommend the UTC review this document. In our opinion, the proposed change would be a disadvantage to users, and hence we do not recommend it.

11. Mongolian

A. Document: **L2/16-292 Comments on the Mongolian block – Weizhe Zheng**

Note: Since the ad hoc review, a revised version of this document has been submitted, as has a separate preliminary proposal for 4 letters for Todo and Ali Gali (L2/16-331). The revised "Comments" document in the Unicode document registry has incorporated comments from Greg Eck.

Discussion: We reviewed this document, which contains (1) comments on the core specification of the Unicode Standard, (2) comments on several glyphs, (3) a preliminary proposed 4 letters for Todo and Ali Gali, and (4) six new variation sequences.

Section 1 discusses comments text in the core specification. Any potential changes to the core spec will require review and confirmation from experts.

On page 2, the comment reads, "On page 534, U+1885 MONGOLIAN LETTER ALI GALI BALUDA and U+0F85 TIBETAN MARK PALUTA are associated with Sanskrit *avagraha*. This association does not seem to be accurate", and both are identified as being related to Sanskrit numeral three. However, the text on *baluda* in the Mongolian block intro says that both MONGOLIAN LETTER ALI GALI BALUDA and TIBETAN MARK PALUTA are historically related, and are used to transliterate *avagraha*. The text does not state that Mongolian *baluda* and Tibetan *paluta* are necessarily related to Sanskrit *avagraha*. It is unclear what the comment relates to in the Mongolian block intro. Does the comment on *piluta* require a change of wording in the Tibetan section?

We recommend the proposal for the 4 letters for Todo and Ali Gali be pulled out, and submitted separately (with evidence). Because the model for Mongolian is still unstable, we suggest a delay on trying to add more characters at this time.

Recommendations: We recommend the UTC forward the document to Greg Eck for his evaluation (on sections 2-4), and invite UTC members with expertise in Mongolian to review section 1 in order to identify any changes that need to be made.

B. Document: L2/16-309 Proposed additions for Mongolian in 5th edition of UCS – Chen et al.

Background docs:

L2/16-259 WG2#65 Mongolian Discussion Points – Eck and Ou Rileke

L2/16-261 Modifications to Mongolian Encoding in UCS – China, Mongolian NB
L2/16-258 Mongolian Base Forms, Positional Forms, & Variant Forms – Eck
L2/16-266 Comments on Mongolian, Small Khitan, and other WG2 #65 documents – Anderson et al.
L2/16-297 Mongolian adhoc report – Anderson

Discussion: We reviewed this document. We note that the title should be "Proposed additions for Mongolian in *an Amendment of* the 5th edition of UCS", since the 5th edition just passed its DIS ballot, and these changes would only appear in an amendment.

The following were comments that were raised during discussion:

- What does "interchange period" (such as U+1834) indicate?
- The proposed revisions cannot be replicated in the names list, which is not the appropriate place to catalog the glyphs for all periods of Mongolian.

  The comments in the Mongolian Ad Hoc report L2/16-297 apply to the proposed changes in L2/16-309:

  > The workload required to produce code charts and names lists as suggested would create an extremely heavy a burden for the Unicode and ISO/IEC 10646 editors. Instead, users are encouraged to create a Unicode Technical Note in the desired format. This UTN would be a post-processing action, but not one for code chart generation.

- The document L2/16-309 does not include the changes agreed to at WG2, as captured in the Mongolian Ad Hoc report L2/16-297. For example, the second form isolate of U+1887, which attendees agreed to deprecate at WG2, now contains a new glyph. The fifth final form of U+1887 in the Ad Hoc report is now the *sixth* final form. Also, it is unclear what happened to the following, which is a sequence for the third form (medial) for U+182D in the ad hoc report (and the CD):

  Because the sequences agreed to at WG2 have not be incorporated in this document, the overall stability of Mongolian appears to be still fluid and uncertain. Nevertheless, specific fixes are invited (i.e., an error in the glyph for a specific sequence or character), as long as evidence provided.

Recommendations: We recommend the UTC review this document and relay the comments (including those above) to the document submitters.

SYMBOLS
12. Astrology
A. Document: L2/16-174 Extra Aspect Symbols for Astrology – Faulks

Discussion: We reviewed this proposal for 10 characters that are used by some astrologers to indicate aspects.

The following capture the comments raised in discussion:

- For SEMISQUARE ASPECT, we recommend U+2220 ANGLE be used and the names list be annotated
- For PARALLEL ASPECT, use U+2225 PARALLEL TO, adding an annotation to U+2225
- For CONTRA PARALLEL ASPECT, use U+2226 NOT PARALLEL TO, adding an annotation

- For CROSS ON BASE, use U+00B1 PLUS-MINUS SIGN, adding an annotation
- For cross below line, shown in Sample 5.04, use U+2213 MINUS-OR-PLUS SIGN, adding an annotation.

The remaining 6 signs (§5), which are used in Russia, show good evidence and, in our opinion, are good candidates for encoding.

The set of aspect characters in the Miscellaneous Symbols block in the range U+26B9..U+26BC contain one-word names (SEXTILE, SEMISEXTILE, QUINCUNX, and SESQUIQUADRATE), so we recommend following that pattern rather than names that describe the shape. Hence, we suggest the following names (which appear in the proposal on page 13):

QUINTILE (instead of "overlaid up and down chevrons")
TREDECILE (instead of "overlaid cross and low chevron")
NOVILE (instead of "overlaid up and down triangles")
BINOVILE (instead of "box impaled on up tack")
CENTILE (instead of "triangle with extension")
VIGINTILE (instead of "box on chevron")

Recommendations: We recommend the UTC review this proposal, and accept the following six characters for encoding in the Miscellaneous Symbols and Arrows block:

2BF0 QUINTILE
2BF1 TREDECILE
2BF2 NOVILE
2BF3 BINOVILE
2BF4 CENTILE
2BF5 VIGINTILE

B. L2/16-173 Eris and Sedna Symbols – Faulks
Note: The proposal for the Eris and Sedna symbols was discussed at the prior script ad hoc, but was not discussed at the August 2016 UTC.

Discussion: We reviewed this proposal, which requests three symbols for these trans-Neptunian objects: two for Eris and one for Sedna. The characters all are documented, and the names are appropriate.

Recommendations: We recommend the UTC review the proposal and, after discussion, accept the following three characters:

2BD8 ERIS FORM ONE
2BD9 ERIS FORM TWO
2BDA SEDNA

Since Sedna is derived from a ligature of two Unified Canadian Aboriginal Syllabics, we recommend a cross-reference to the relevant characters be added.

13. Chess
Document: L2/16-293 Proposal to Encode Heterodox Chess Symbols – Wallace

Discussion: We reviewed this well-researched proposal for 93 characters used in chess problems and

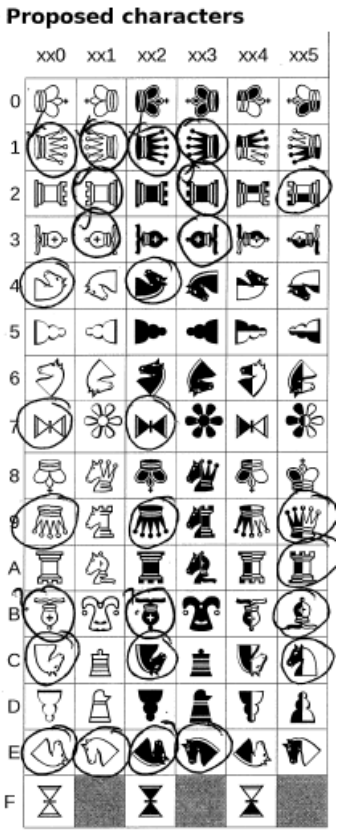
variant games. The proposal contains a mix of symbols, some historical (including those from *shatranj*, a predecessor of chess), and others that are found in modern fonts and software packages.

The medieval symbols, such as the *fers* and elephant, appear to be variants of modern symbols and may not be used contrastively with modern symbols (as noted on page 7). We suggest the author remove the historical characters (i.e., the medieval *shatranj* symbols), so they can be considered separately.

Other comments:

- Provide more than one example of each character (hence, include another example of the joker, besides the Wikipedia article), drawing on print material, or highly formatted text on the Web, similar to the attestations on: http://www.probleemblad.nl/images/Documenten/handleiding_inleiding_in_het_fairyschaak.pdf
- In our view, neither "Alternative Proposal 1" (§7.1), which suggests use of ligatures to create compound of half symbols, nor "Alternative Proposal 2" (§7.2), which proposes use of ZWJ for compounds, are advisable. Creating ligatures on the fly or using ZWJ are not useful mechanisms for symbols, in our view.
- Revise the proposal to include the set of characters with reasonably modern representations.
- Which characters are the most widely used today? It is not clear that all rotations and combinations are needed.

The following 27 circled characters appear to have sufficient plain text evidence, as provided in the proposal:



Recommendations: We recommend the UTC review this proposal, send comments to the author (including the comments above), and invite the author to submit a revised version of the proposal.