

TO: UTC
FROM: Deborah Anderson, Jan Kučera, Ken Whistler, Roozbeh Pournader, and Peter Constable¹
SUBJECT: Recommendations to UTC #177 November 2023 on Script Proposals
DATE: October 25, 2023

The Script Ad Hoc group met on August 11 and 18, September 8 and 15, and October 13, 2023, in order to review proposals. The following represents feedback on proposals that were available when the group met.

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¹ Also participating were Craig Cummings, Lorna Evans, Karljürgen Feuerherm, Manish Goregaokar, Liang Hai, Ned Holbrook, Anushah Hossain, John Hudson, Richard Ishida, Denis Moyogo Jacquerye, James Kirby, Robin Leroy, Norbert Lindenberg, Kamal Mansour, Kirk Miller, Cheon Hyeong Sim, Logan Simpson, Michel Suignard, Harald Tveiten, Lawrence Wolf-Sonkin, and Ben Yang. The text for the comments and recommendations was based on notes primarily by Jan Kučera with assistance from Debbie Anderson.

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A. PROPOSALS REQUIRING UTC ACTION

I. AFRICA

1 Egyptian Hieroglyphs

Action: For UTC discussion and decision (on L2/23-254)

Documents: [L2/23-253](#) Working draft of Proposed Draft Unicode Standard Annex # 57 Egyptian Hieroglyph Database – Michel Suignard

[L2/23-254](#) Standardized Variation Sequences stability – Michel Suignard

Recommendation: We recommend the UTC make the following disposition:

Discuss L2/23-254 on the stability of SVSes and make a decision.

Comments: We reviewed an earlier version of the Proposed Draft UAX #57 Egyptian Hieroglyph Database, which was prepared by Michel Suignard, based on an Action Item from the July UTC ([176-A112](#)). This document describes the properties for the Egyptian Hieroglyphs repertoire; its format is based on the Unicode Han Database (UniHan, [UAX #38](#)). This document proposes that the properties defined have non-immutable values that may be subject to change.

The posted version accommodates several suggestions by the SAH. Other UTC members are encouraged to review the document and send any feedback to the document author.

Note that this Proposed Draft #57 already has an Action Item for Rick McGowan to post a PRI for the Proposed Draft #57 [[176-A113](#)].

Doc L2/23-254 on the stability of Standardized Variation Sequences was not seen by the SAH but will require a decision by the UTC so work on the Egyptian Hieroglyphs proposal and a proposal for rotations can be finalized.

II. EUROPEAN SCRIPTS (For scripts that originated from Europe)

2. Latin

2a Lambda Characters

Action: For UTC discussion and decision

Document: [L2/23-197](#) Three Latin Lambdas for version 16.0 Request -- Kevin King

Related document: [L2/23-191](#) Proposal to Encode 3 Additional Latin Characters for Wakashan and Salishan Languages to the Unicode Standard -- Robyn Humchitt, Denis Jacquerye, Kevin King

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R1: Add the three provisionally assigned lambda characters (U+A7DA LATIN CAPITAL LETTER LAMBDA, U+A7DB LATIN SMALL LETTER LAMBDA, U+A7DC LATIN CAPITAL LETTER LAMBDA)

WITH STROKE) to the repertoire approved for publication as part of Unicode version 16.0. (Reference: 176-C31 and Section 2a of L2/23-238)

Action Item for Ken Whistler, UTC: Update the Pipeline, to account for the addition of U+A7DA..U+A7DC to the approved repertoire for Unicode 16.0. (Reference: Section 2a of L2/23-238)

Action Item for Markus Scherer, PAG: Update the relevant UCD data files in preparation for Unicode 16.0, to account for the addition of U+A7DA..U+A7DC to the approved repertoire for Unicode 16.0. (Reference: Section 2a of L2/23-238)

Comments: We discussed a request to advance three provisionally assigned lambda characters to be approved for encoding in the Unicode 16.0 release, as they are urgently needed by the community. We are generally in favor of this recommendation. As is the case with all provisionally assigned code points, we advise the UTC to restrain from changing these code points without strong justification. One of the points of the provisional assignment is to provide a measure of stability that permits preparation of charts, UCD, and Core Spec to happen with known code points. For the communities using the lambda characters, retaining the provisional code points will also avoid disrupting the ongoing migration of the community's text corpora.

One participant voiced some concerns about the names of the three characters, their collation, and architectural issues in different orthographies. However, no document was presented to the group. Other communities do not need to switch to the new characters, if not deemed appropriate. We encourage anyone with concerns about encoding the three lambda characters as proposed to submit written feedback as soon as possible.

It was noted that even if the characters were published in 16.0, the community should not expect automatic case conversion to work on applications for a few years. Similarly, it may take time for the positioning of combining marks to be correct.

2b Latin pharyngeal voiced fricative characters

Action: For UTC discussion and decision

Document: [L2/23-219](#) Proposal to add two Latin pharyngeal voiced fricative characters -- Denis Moyogo Jacquerye

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R2: Consensus: Provisionally assign 2 codepoints U+A7CE LATIN CAPITAL LETTER PHARYNGEAL VOICED FRICATIVE and U+A7CF LATIN SMALL LETTER PHARYNGEAL VOICED FRICATIVE and change the general category of U+0295 LATIN LETTER PHARYNGEAL VOICED FRICATIVE from LI to Lo, for a future version of the standard. (Reference: L2/23-219 and Section 2b of L2/23-238)

Action Item for Ken Whistler, UTC: Update the Pipeline to add the provisionally assigned characters U+A7CE LATIN CAPITAL LETTER PHARYNGEAL VOICED FRICATIVE and U+A7CF LATIN SMALL LETTER

PHARYNGEAL VOICED FRICATIVE, as documented in L2/23-219.

Action Item for Debbie Anderson, SAH: Work with Kirk Miller to send the font to Michel Suignard and the Charts Group. (Reference: Section 2b of L2/23-238)

Comments: We reviewed a proposal to add two Latin pharyngeal voiced fricative characters and change the general category of U+0295 from LI to Lo. This change has a precedent in the case of U+0294, which was changed from gc=LI to gc=Lo, when the cased pair of glottal stops (U+0241/U+0242) was added in Unicode 5.0.

The proposal demonstrated the need for a new Latin pharyngeal voiced fricative case pair for the orthography of Pilagá of Argentina, which requires bicameral characters that have a capital at cap height and lowercase at x-height. A case was also made to change the general category for U+0295 LATIN LETTER PHARYNGEAL VOICED FRICATIVE from “LI” to “Lo” for continued use in unicameral orthographies with a pharyngeal voiced fricative.

Concern was raised about identifiers and IDNA. However, validity for IDNA identifiers does not depend on whether a letter is gc=LI or gc=Lo, so there is no stability issue for the existing character, U+0295; it will stay PVALID. The implications for the **new** case pair for IDNA identifiers would be as for any newly-introduced case pair: the lowercase of the pair will be PVALID, and the uppercase of the pair will be DISALLOWED. The mapping for case pairs is handled outside the protocol, per se.

III. MIDDLE EASTERN SCRIPTS

3 Arabic

3a Arabic Double Vertical Bar Below

Action: For UTC discussion and decision

Document: [L2/23-248](#) Arabic Double Vertical Bar Below -- Lateef Sagar Shaikh

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R3: Consensus: Provisionally assign U+10EFA ARABIC DOUBLE VERTICAL BAR BELOW, based on L2/23-248.

Action Item for Ken Whistler, UTC: Update the Pipeline to add the provisionally assigned character U+10EFA ARABIC DOUBLE VERTICAL BAR BELOW, as documented in L2/23-248.

Action Item for Lorna Evans, SAH: Provide a font and forward it to Michel Suignard and the Charts Group. (Reference: Section 3 of L2/23-238)

Comments: We reviewed this proposal which requested one character and incorporates changes and additional evidence provided by SAH members. We recommend the UTC assign a provisional code point for it.

3b Kashmiri Yeh

Action: FYI with action to record

Document: [L2/23-241](#) Annotations for Kashmiri Yeh -- Manish Goregaokar

Recommendation: We recommend the UTC make the following disposition:

Action Item for Ken Whistler, EDC: Add annotations to U+0620 ARABIC LETTER KASHMIRI YEH and U+06CD ARABIC LETTER YEH WITH TAIL in NamesList.txt for Unicode 16.0, as proposed in L2/23-241

Comments: We reviewed this document which addresses a problem submitted to CLDR ([CLDR-16595](#)). The CLDR feedback was from a Kashmiri native speaker, who stated that U+06CD ARABIC LETTER YEH WITH TAIL “is not a Kashmiri Character.”

The document L2/23-241 investigated the use in Kashmiri of U+06CD ARABIC LETTER YEH WITH TAIL and U+0620 ARABIC LETTER KASHMIRI YEH and proposes two annotations, as noted in L2/23-241, page 4.

This document has been reviewed by a native speaker and now incorporates feedback from the Script Ad Hoc.

We support the proposed annotations.

3c Request to make UTR #53 a UAX

Action: For UTC action and decision

Document: [L2/23-210](#) Recommendation for UTR #53 to become a UAX

Recommendations: We recommend the UTC make the following disposition:

SAH-UTC-177-R4: Consensus: Approve proposed update UTR #53 for publication. (Reference: Section 3c of L2/23-210)

Action Item for Lorna Evans, Roozbeh Pournader, and Bob Hallissy, SAH: Prepare UTR #53 for publication. (Reference: Section 3c of L2/23-238)

Action Item for Rick McGowan, UTC: Post approved UTR #53. (Reference: Section 3c of L2/23-238)

Action Item for Rick McGowan, UTC: Close PRI #479. (Reference: Section 3c of L2/23-238)

SAH-UTC-177-R5: Consensus: Change the status of UTR #53 to a UAX #53 and publish an updated specification as part of Unicode 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Lorna Evans, Roozbeh Pournader, and Bob Hallissy, SAH: Prepare proposed update UAX #53 for Unicode 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Rick McGowan, UTC: Post PRI for proposed update UAX #53, for 16.0, to close January 2, 2024. (Reference: Section 3c of L2/23-238)

Action Item for Rick McGowan, UTC: Action Item for Rick McGowan, UTC: On the reports/index.html

page, reflect the change of status for UTR #53 to UAX #53, for Unicode 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Ken Whistler, EDC: Add UAX #53 to the list of annexes in the core spec for 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Peter Constable, RMG: Add UAX #53 to BRS and other release process documents for 16.0. (Reference: Section 3c of L2/23-238)

SAH-UTC-177-R6: Consensus: Add a new normative, binary character property, Modifier_Combining_Mark (short name: MCM) to the UCD, for 16.0, based on L2/23-210.

Action Item for Markus Scherer, PAG: Add MCM property values to PropList.txt, for 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Markus Scherer, PAG: Add property and property value aliases for MCM to PropertyAliases.txt and PropertyValueAliases.txt, for 16.0 (Reference: Section 3c of L2/23-238)

Action Item for Ken Whistler, PAG: Add documentation of MCM to property lists in UAX #44, for 16.0. (Reference: Section 3c of L2/23-238)

Action Item for Ken Whistler, EDC: Add AMTRA to the list of Unicode algorithms in the core spec, for 16.0. (Reference: Section 3c of L2/23-238)

Comments: This document is a request to make UTR #53 become UAX. Some editorial feedback was provided during SAH discussion and has been incorporated in L2/23-210.

We recommend the UTC accept this request to change UTR #53 to a UAX.

4 Sumero-Akkadian Cuneiform

Action: For UTC discussion and decision

Document: [L2/23-229](#) Proposed changes to PDUTR #56 – Robin Leroy

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R7: Advance the Proposed Draft Unicode Technical Report #56 to Draft status (Reference: Section 4 of L2/23-238)

Action Item for Rick McGowan, UTC: Close PRI #482. (Reference: Section 4 of L2/23-238)

Action Item for Rick McGowan, UTC: Post a PRI for Draft Unicode Technical Report #56, to close January 2, 2024. (Reference: Section 4 of L2/23-238)

Comments: We reviewed the proposed changes to PDUTR #56. The changes look fine to the Script Ad Hoc, and we recommended they be incorporated into the draft and then posted. (The revised document has been posted in [PRI #482](#).)

IV. SCRIPTS FROM EAST ASIA

5 Tangut

5a Glyph corrections

Action: For UTC discussion and decision

Documents: [L2/23-148](#) Glyph corrections for four Tangut ideographs (WG2 N5237) - West
[L2/23-155](#) Evidence for Glyph Forms of U+17121 and U+17C51 - West

Recommendation: We recommend UTC make the following disposition:

SAH-UTC-177-R8: Consensus: Accept the glyph change for 4 Tangut ideograph characters U+17121, U+17C51, U+17D0B, and U+180DF based on document L2/23-148 for Unicode version 16.0.

Action Item for Debbie Anderson, SAH: Request a font for the Tangut glyph changes from Andrew West and forward to Michel Suignard and the Charts Group. (Reference: Section 5a of L2/23-238)

Comments: This document was mentioned in the July 2023 recommendations [L2/23-164](#) (p. 24, Section 25), stating that feedback from Tangut experts from China was not yet received. Since that time, the Tangut experts have responded and have agreed to the proposed glyph changes.

5b 114 Tangut Components

Action: For UTC action

Documents: [L2/23-247](#) Proposal to encode 114 Tangut components (WG2 N5218R2)-- West

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R9: Consensus: Provisionally assign 114 Tangut components in the range U+18D82..U+18DF3 in a new Tangut Components Supplement block spanning U+18D80..U+18DFF, based on L2/23-247.

Action Item for Ken Whistler, UTC: Update the Pipeline to add as provisionally assigned characters 114 Tangut components in the range U+18D82..U+18DF3 in a new Tangut Components Supplement block spanning U+18D80..U+18DFF, as documented in L2/23-247.

Action Item for Ken Whistler, Roadmap Committee: Relay to the Roadmap Committee that the name of the new Tangut block needs to be corrected: it should be Tangut **Components** Supplement block. (Reference: Section 5b of L2/23-238)

Action Item for Debbie Anderson, SAH: Work with Andrew West to forward a font to Michel Suignard and the Charts Group for 114 Tangut components. (Reference: Section 5b of L2/23-238)

Comments: We reviewed this proposal, which is a revised version of L2/23-150. The proposal now includes code points in Table 1 and a section on properties, as were requested by the SAH. This proposal has been reviewed by Tangut experts in China who support it.

N.B. An Action Item was captured at the July 2023 UTC meeting for Ken Whistler and the Roadmap Committee to add a new Tangut “Component” Supplement block [176-A126]. However, there was an error in the name of the block in the Action Item. The Action Item should have had the spelling Tangut **Components** Supplement (which is captured correctly above in the Consensus and Action Items).

5c Two Tangut Components and 28 Tangut Ideographs

Action: For UTC discussion and action

Document: [L2/23-246](#) Proposal to encode 2 Tangut components and 28 Tangut ideographs (WG2 N5217R2) -- West

Recommendations: We recommend the UTC make the following disposition:

SAH-UTC-177-R10: Consensus: Provisionally assign 2 Tangut components U+18D80 and U+18D81 in a new Tangut Components Supplement block (which spans U+18D80..U+18DFF) and 28 Tangut ideographs in the range U+187F8...U+187FF and U+18D09..U+18D1C, based on L2/23-246.

Action Item for Ken Whistler, UTC: Update the Pipeline to add as provisionally assigned characters 2 Tangut components U+18D80..U+18D81 in the new Tangut Components Supplement block (which spans U+18D80..U+18DFF) and 28 Tangut ideographs in the range U+187F8...U+187FF and U+18D09..U+18D1C, as documented in L2/23-246.

Action Item for Debbie Anderson, SAH: Work with Andrew West to forward a font to Michel Suignard and the Charts Group. (Reference: Section 5c of L2/23-238)

Action Item for Michel Suignard, SAH: Prepare changes to TangutSources.txt to add a new source reference and data as given in L2/23-246, to be incorporated into a future version concurrent with encoding of the provisionally assigned characters also described in L2/23-246. (Reference: Section 5c of L2/23-238)

Comments: We reviewed this proposal (L2/23-246), which is a revision of L2/23-149. The SAH had earlier recommended (L2/23-164, Section 5) that the 8 ideographs be placed at the end of the Tangut block and the remaining 28 go into the Tangut Supplement block, changes that have been incorporated in this document. The proposal now includes a section on properties and information for TangutSources.txt. Tangut experts in China have reviewed the proposal and are supportive of it.

6 Khitan Small Script

Action: For UTC discussion and action

Document: [L2/23-199](#) Glyph correction for Khitan Small Script U+18BD2 – West

Recommendation: We recommend UTC make the following disposition:

SAH-UTC-177-R11: Consensus: Accept the glyph change for U+18BD2 KHITAN SMALL SCRIPT CHARACTER-18BD2, based on document L2/23-199, for Unicode version 16.0.

(No Action Item is needed for the font, as Michel Suignard already has received one from Andrew West.)

Comments:

We have received a favorable response from experts in China on correcting the glyph for U+18BD2 KHITAN SMALL SCRIPT CHARACTER-18BD2, who support the proposed change. In our view, there is no need for a glyph errata notice.

V. SCRIPTS FROM SOUTH ASIA

7 Tulu-Tigalari

Action: For UTC discussion and decision

Document: [L2/23-217](#) Summary of Script Extensions for Tulu-Tigalari – Srinidhi and Sridatta

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R12: Consensus: Add Tulu-Tigalari entries to ScriptExtensions.txt file as documented in L2/23-217 for Unicode version 16.0.

Action Item for Roozbeh Pournader, SAH: Add the value Tutg (Tulu-Tigalari) in ScriptExtensions.txt for the characters listed in L2/23-217 for Unicode version 16.0. (Reference: Section 7 of L2/23-238)

Comments: We briefly reviewed this proposal to add Tulu-Tigalari to ScriptExtensions.txt for two Vedic signs (U+1CF2 and U+1CF4), U+A8F1 COMBINING DEVANAGARI SIGN AVAGRAHA. and six Common Indic Number Forms (U+A830..U+A835).

We verified the attestations and agreed the proposal is justified. (The summary on the bottom of page 1 and top of page 2 provides a summary of all the characters that should add Tulu-Tigalari value to ScriptExtensions.txt, which includes those listed above and ten Kannada digits U+0C36..U+0CEF.)

VI. COMBINING MARKS

8 Compound Tone Diacritics II

Action: For UTC discussion and decision

Document: [L2/23-208](#) Unicode request for compound tone diacritics II

Recommendation: We recommend UTC make the following disposition:

SAH-UTC-177-R13: Consensus: Provisionally assign the following 3 code points for compound tone diacritics, as described in L2/23-208:

U+1AD6 COMBINING VERTICAL-LINE-ACUTE-GRAVE

U+1AD7 COMBINING VERTICAL-LINE-GRAVE-ACUTE

U+1AD8 COMBINING MACRON-ACUTE-GRAVE

Action Item for Ken Whistler, UTC: Update the Pipeline with the provisionally assigned characters for compound tone diacritics:

U+1AD6 COMBINING VERTICAL-LINE-ACUTE-GRAVE

U+1AD7 COMBINING VERTICAL-LINE-GRAVE-ACUTE

U+1AD8 COMBINING MACRON-ACUTE-GRAVE (Reference: Section 8 of L2/23-238)

Action Item for Debbie Anderson, SAH: Work with Kirk Miller to send the font to Michel Suignard and the Charts Group. (Reference: Section 8 of L2/23-238)

Comments: We reviewed this proposal for three tone diacritics composed of the vertical line or the macron with acute and grave accents. This set is similar to the six compound tone diacritics proposed in L2/23-188, which were provisionally assigned code points at the July 2023 UTC meeting (consensus [176-C35]). Evidence is provided for the three proposed diacritics.

9 Harrington Diacritics

Action: For UTC discussion and decision

Document: [L2/23-206](#) Unicode request for Harrington diacritics - Yoram Meroz, et al.

Recommendation: We recommend UTC make the following disposition:

SAH-UTC-177-R14: Consensus: Provisionally assign the following 5 code points for Harrington diacritics as described in L2/23-206:

U+1AD9 COMBINING SHARP SIGN

U+1ADA COMBINING FLAT SIGN

U+1ADB COMBINING DOWN TACK ABOVE

U+1ADC COMBINING FALLING DIAGONAL DIAERESIS

U+1ADD COMBINING DOT-AND-RING BELOW

Action Item for Ken Whistler, UTC: Update the Pipeline with the provisionally assigned characters for 5 Harrington diacritics:

U+1AD9 COMBINING SHARP SIGN

U+1ADA COMBINING FLAT SIGN

U+1ADB COMBINING DOWN TACK ABOVE

U+1ADC COMBINING FALLING DIAGONAL DIAERESIS

U+1ADD COMBINING DOT-AND-RING BELOW. (Reference: Section 9 of L2/23-238)

Action Item for Debbie Anderson, SAH: Work with Kirk Miller to send the font to Michel Suignard and the Charts Group. (Reference: Section 9 of L2/23-238)

Comments: We reviewed this proposal for combining diacritics used in the manuscripts of the linguist John Peabody Harrington, and used by linguists and archivists working with Harrington’s material, as well as some communities in their language-revival projects.

Discussion focused on one symbol in particular, the COMBINING SHARP SIGN. In 2020, U+1AC6 COMBINING NUMBER SIGN ABOVE was proposed (L2/20-182) and was published in Unicode 14.0 for a Chumash dictionary that relied on Harrington’s work. However, this diacritic is actually a musical sharp sign for high pitch, and was paired with a combining flat sign for low pitch. The SAH agreed that it would be useful to add the new U+1AD9 COMBINING SHARP SIGN alongside a new COMBINING FLAT SIGN. As noted on page 2 in the proposal, Stokoe notation of Italian Sign Language could make use of the existing character U+1AC6. A member of the Barbareño/Ventureño Band of Mission Indians (Chumash) community is co-author of this proposal, and agreed that the new code point would not present any problem for the community, as the character is used currently only in raw transcripts. The other combining marks were acceptable to the group.

VII. SYMBOLS

10 Symbols: Asteroid symbols

Action: For UTC discussion and decision

Document: [L2/23-207](#) Unicode request for historical asteroid symbols – Kirk Miller and Gavin Jared Bala

Recommendation: We recommend UTC make the following disposition:

SAH-UTC-177-R15: Consensus: Provisionally assign 21 code points for historical asteroid symbols: 17 code points U+1CEC0..U+1CED0 in a new block Miscellaneous Symbols Supplement, whose range extends from U+1CEC0 to U+1CEFF, and 4 code points U+1F777 to U+1F77A in the Alchemical Symbols block, as described in L2/23-207.

Action Item for Ken Whistler, UTC: Update the Pipeline with the 21 provisionally assigned characters for historical asteroid symbols, 17 code points U+1CEC0..U+1CED0 in a new block Miscellaneous Symbols Supplement, whose range extends from U+1CEC0 to U+1CEFF, and 4 code points U+1F777 to U+1F77A in the Alchemical Symbols block, as described in L2/23-207 and Section 10 of L2/23-238.

Action Item for Debbie Anderson, SAH: Work with Kirk Miller to send the font to Michel Suignard and the Charts Group. (Reference: Section 10 of L2/23-238)

Comments: We reviewed a proposal to encode historical asteroid symbols and were satisfied with the evidence of usage. We suggest the symbols fill the remaining 4 spots in the Alchemical Symbols block and then put the remaining 17 in a new block called Miscellaneous Symbols Supplement, whose range extends from U+1CEC0 to U+1CEFF.

We discussed the names of the characters and preferred names of the asteroids over descriptive names. The names of bodies already represented by other characters can be numbered, e.g., PLUTO FORM TWO, PLUTO FORM THREE, etc.

Because there is already a character U+2BD8 PROSERPINA, we agree the name ASTRONOMICAL SYMBOL FOR ASTEROID PROSERPINA would be acceptable, as it follows the pattern for URANUS (U+2645 URANUS and U+26E2 ASTRONOMICAL SYMBOL FOR URANUS).

11 Symbols: Chemical Symbols

Action: For UTC discussion and decision

Document: [L2/23-193R2](#) Proposal for Ten Chemical Symbols – Soiffer et al.

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R16: Consensus: Provisionally assign the following 10 code points for chemical symbols, based on L2/23-193R2:

2B96 MEDIUM SMALL WHITE CIRCLE WITH HORIZONTAL BAR
1F8D0 LONG RIGHTWARDS ARROW OVER LONG LEFTWARDS ARROW
1F8D1 LONG RIGHTWARDS HARPOON OVER LONG LEFTWARDS HARPOON
1F8D2 LONG RIGHTWARDS HARPOON ABOVE SHORT LEFTWARDS HARPOON
1F8D3 SHORT RIGHTWARDS HARPOON ABOVE LONG LEFTWARDS HARPOON
1F8D4 LONG LEFTWARDS HARPOON ABOVE SHORT RIGHTWARDS HARPOON
1F8D5 SHORT LEFTWARDS HARPOON ABOVE LONG RIGHTWARDS HARPOON
1F8D6 LONG RIGHTWARDS ARROW WITH THROUGH X
1F8D7 LONG RIGHTWARDS ARROW WITH DOUBLE SLASH
1F8D8 LONG LEFT RIGHT ARROW WITH DEPENDENT LOBE

Action Item for Ken Whistler, UTC: Update the Pipeline with the ten provisionally assigned chemical symbols, as documented in L2/23-193R2.

Action Item for Debbie Anderson, SAH: Work with Asmus Freytag to append a Proposal Summary form to the proposal and forward a font to Michel Suignard and the Charts Group. (Reference: Section 11 of L2/23-238)

Comments: We reviewed this proposal which had been revised based on earlier SAH comments. We agreed on the set of ten symbols. (An earlier typographical error for U+2B96 was noted and has been corrected in L2/23-193R2.)

The glyph for the MEDIUM SMALL WHITE CIRCLE WITH HORIZONTAL BAR (standard state symbol, also known as “Plimsoll” mark) should not be shown in the code charts with a superscripted representative glyph or be given a superscript compatibility decomposition. For its common use in chemical notation in a raised position, the same generic stylistic mechanisms used to superscript other symbols would be used..

The annotation currently at U+29B5 CIRCLE WITH HORIZONTAL BAR (“used in superscripted form to mean standard state [chemistry]”) should be moved to U+2B96, once U+2B96 is added.

12 Symbols: Geomantic Figures

Action: For UTC discussion and decision

Document: [L2/23-218](#) Proposal to encode Geomantic Figures - Pollard

Recommendation: We recommend UTC to make the following disposition:

SAH-UTC-177-R17: Consensus: Provisionally assign 16 code points U+1CEE0..U+1CEEF for geomantic figures, based on L2/23-218.

Action Item for Ken Whistler, UTC: Update the Pipeline with the 16 provisionally assigned characters for geomantic figures from U+1CEE0..U+1CEEF. (Reference: Section 12 of L2/23-238)

Action Item for Debbie Anderson, SAH: Forward the geomantic figures font to Michel Suignard and the Charts Group. (Reference: Section 12 of L2/23-238)

Comments: We reviewed this proposal for 16 divinatory geomantic symbols, which was revised based on SAH comments. Questions about directionality have been addressed on page 3. We agreed that the Latin names are acceptable, as the names have been stable for several years.

In short, we were satisfied that all the feedback from the Script Ad Hoc has been addressed by the author and hence we recommend the proposed characters for encoding.

13 Symbols: Legacy Computing

Action: For UTC discussion and decision

Document: [L2/23-252](#) Proposal to disunify Symbols for Legacy Computing from emoji -- Bettencourt and Ewell

Related document: [L2/23-142](#) Proposal to Define Variation Sequences for Emoji Mapped to Legacy Computing Symbols -- Charlotte Buff

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R18: Consensus: Provisionally assign the following code points for ten symbols, as described in L2/23-252:

1CCFA SNAKE SYMBOL

1CCFB FLYING SAUCER SYMBOL

1CCFC NOSE SYMBOL

1CEBA FRAGILE SYMBOL

1CEBB OFFICE BUILDING SYMBOL

1CEBC TREE SYMBOL

1CEBD APPLE SYMBOL

1CEBE CHERRY SYMBOL
1CEBF STRAWBERRY SYMBOL
1FBFA ALARM BELL SYMBOL

Action Item for Ken Whistler, UTC: Update the Pipeline to add the ten provisionally assigned characters, as described in L2/23-252.

Action Item for Debbie Anderson, SAH: Forward the font for the ten symbols described in L2/23-252 to Michel Suignard and the Charts Group. (Reference: Section 13 of L2/23-238)

Comments: In [L2/23-142](#) Charlotte Buff recommended variation sequences for ten characters that had been unified with emoji. (Her evidence drew from the tables attached to L2/21-235R and for BELL, L2/19-025.)

Background on the issue (provided by Ned Holbrook, ESC):

Unifying emoji with pre-existing characters was a mistake and the Emoji Subcommittee has a standing agreement with UTC to only propose new characters with Emoji_Presentation, rather than adding Emoji to existing characters, largely in hopes of avoiding the need for new presentation sequences (using text and emoji variation selectors). These legacy computing symbols are the first time we have encountered a need for the opposite case of a character with Emoji_Presentation needing to be used as non-emoji.

The following options were discussed:

1. Accept the proposal in the document, i.e., add variation selector for selected emojis.
2. Define variation selectors to be valid for all emojis. This places unnecessary burden on implementations due to unclear text representations and font fallback scenarios.
3. Encode new, non-emoji versions of the characters as separate characters.
4. Do not do anything. The application (terminal emulation) does not need to use Unicode for backing storage.

The SAH recommended option 3, and asked the authors of the legacy computing proposal to propose 10 new characters that had been unified with emoji in the Legacy Computing proposals. The document L2/23-252 proposes those 10 characters. The SAH supports the encoding of the 10 symbols in L2/23-252.

14 Symbols (Punctuation): Quotation Marks

Action: For UTC discussion and decision

Document: [L2/23-212R](#) Proposal to add standardized variation sequences for four quotation marks – Lunde

Recommendation: We recommend the UTC make the following disposition:

SAH-UTC-177-R19: Consensus: Add the following eight standardized variation sequences, based on L2/23-212R, for Unicode version 16.0:

2018 FE00; non-fullwidth form; # LEFT SINGLE QUOTATION MARK
2018 FE01; right-justified fullwidth form; # LEFT SINGLE QUOTATION MARK
2019 FE00; non-fullwidth form; # RIGHT SINGLE QUOTATION MARK
2019 FE01; left-justified fullwidth form; # RIGHT SINGLE QUOTATION MARK
201C FE00; non-fullwidth form; # LEFT DOUBLE QUOTATION MARK
201C FE01; right-justified fullwidth form; # LEFT DOUBLE QUOTATION MARK
201D FE00; non-fullwidth form; # RIGHT DOUBLE QUOTATION MARK
201D FE01; left-justified fullwidth form; # RIGHT DOUBLE QUOTATION MARK

Action Item for Ken Whistler, UTC: Update the Pipeline page with the eight standardized variation sequences, as described in L2/23-212R.

Action Item for Markus Scherer, PAG: Add the eight variation sequences, as described in L2/23-212R to StandardizedVariants.txt, for Unicode 16.0.

Comments: We reviewed this document, which derives from several previous proposals (L2/18-073, L2/18-013, L2/17-056 and L2/14-006), but is now limited to four quotation mark characters that have been problematic for rendering East Asian text.

The group had several suggestions on the document and how to make it clearer, particularly with more details on current behavior and also on the Hans behavior. The suggested revisions have been incorporated in the revised version.

VIII. OTHER TOPICS

15 Invariants between Indic Positional and Syllabic Categories and General Category

Action: For UTC discussion and decision

Document: [L2/23-200](#) Invariants between Indic positional and syllabic categories and general category -- Norbert Lindenberg

Recommendation: We recommend UTC make the following dispositions:

SAH-UTC-177-R20: Consensus: Change the gc property value for U+1171E AHOM CONSONANT SIGN MEDIAL RA from Mn to Mc and the Bidi_Class value from NSM to L for Unicode version 16.0. (Reference: L2/23-200)

SAH-UTC-177-R21: Consensus: Change the InPC property value for U+0D41 MALAYALAM VOWEL SIGN U and U+0D42 MALAYALAM VOWEL SIGN UU from Right to Bottom for Unicode version 16.0. (Reference: L2/23-200)

Action Item for Roozbeh Pournader, SAH: Update the IndicPositionalCategory.txt and add comments based on document L2/23-238 and discussion in the Script Ad Hoc for Unicode version 16.0.

Action Item for Markus Scherer, PAG: For U+1171E AHOM CONSONANT SIGN MEDIAL RA, change the gc property value from Mn to Mc and Bidi_Class value from NSM to L for Unicode version 16.0. (Reference: Section 15 of L2/23-238)

Comments: We reviewed this document. The Script Ad Hoc did not agree that invariants should be documented in the data file headers. Instead, comments reflecting changes should appear within the data files.

We agreed to the following property value assignments:

U+1171E AHOM CONSONANT SIGN MEDIAL RA should change gc from Mn to Mc and Bidi_Class value from NSM to L

U+0D41 MALAYALAM VOWEL SIGN U and U+0D42 MALAYALAM VOWEL SIGN UU should change InPC from Right to Bottom.

16 Re-ordering Virama

Action: For UTC discussion and decision

Document: [L2/23-205](#) Reordering virama – Lindenberg

Recommendations: We recommend the UTC make the following disposition:

SAH-UTC-177-R22: Consensus: Add a new property value Reordering_Killer to IndicSyllabicCategory.txt for Unicode version 16.0. (Reference: L2/23-205 and Section 16 of L2/23-238)

SAH-UTC-177-R23: Consensus: Change the InSC property values for the Batak viramas U+1BF2 BATAK PANGOLAT and U+1BF3 BATAK PANONGONAN from Pure_Killer to Reordering_Killer for Unicode version 16.0. (Reference: L2/23-205 and Section 16 of L2/23-238)

Action Items for Roozbeh Pournader, SAH:

- Add a new property value Reordering_Killer to the Indic Syllabic Category (InSC) property.
- Change the InSC property values for U+1BF2 BATAK PANGOLAT and U+1BF3 BATAK PANONGONAN from Pure_Killer to Reordering_Killer.
- Consider the suggestions provided at the end of L2/23-205 for potential updates to the descriptions of the existing InSC property values (Reference: L2/23-205 and Section 16 of L2/23-238)

Action Item for Markus Scherer, PAG: Add Reordering_Killer to the property aliases for InSC in PropertyValueAliases.txt, for Unicode 16.0.

Comments: We reviewed this request and agreed with it, but recommend the name be changed from Reordering_Virama to Reordering_Killer. The proposal author has relayed his preference for the name “Reordering_Virama” over “Reordering_Killer,” but the SAH still recommends the name “Reordering_Killer.”

17 Required Conjunct Forms in Extended Grapheme Clusters

Action: FYI with action to record

Document: [L2/23-141](#) Required conjunct forms in extended grapheme clusters – Lindenberg

Recommendation: We recommend the UTC make the following disposition:

Action Item for Norbert Lindenberg, SAH: Update L2/23-141 that will (a) take full advantage of the rule constraints in section 1.2 of UAX 29 in order to simplify the proposed rules, and (b) determine which scripts could be made to work with the recently-added rule GB9c, and which would really require a new rule. (Reference: Section 17 of L2/23-238)

Action Item for Manish Goregaokar and Robin Leroy, PAG: Contact Josh Hadley and/or Mark Davis to understand why the current GB9c has a consonant at the beginning. Consider creating a document describing the rationale for the change from the “virama-sequence” rule proposed in L2/18-147 to the rule GB9c proposed in L2/23-079. (Reference: Section 17 of L2/23-238).

Comments: We discussed this document, which proposes an update to the definition of extended grapheme clusters in UAX #29. The [15.1 summary](#) had noted that “the list of scripts affected by [grapheme cluster segmentation rule GB9c in UAX #29] is expected to expand in subsequent version of the Unicode Standard.”

This document proposes adding required conjunct forms represented by a virama-like character + consonants or independent vowel, and tying Myanmar *kinzi* glyphs to their base character.

B. DOCUMENTS NOT REQUIRING UTC ACTION (by script, in alphabetical order): FYI to UTC

18 Bliss

Documents: [L2/23-138](#) Preliminary proposal for encoding Bliss in the UCS (WG2 N5228) -- Everson

Comments: We discussed Blissymbols with the proposal author, Michael Everson. Blissymbols (or “Bliss”) is an ideographic script used primarily today by non-speaking peoples. It is used extensively in Europe, and also appears in Arabic-speaking areas, and Israel (which explains the range of alphabets that are Blissymbol characters found in U+1676F..U+16777).

Of note:

- The Bliss repertoire contains characters that appear to duplicate already encoded characters, but we generally agree they should not be unified with them, since the Bliss characters are ideographs that take combining marks and interact with other Bliss characters.
- Combining marks, called “indicators,” only stack horizontally, never vertically.
- In Bliss, a dotted square is preferred instead of a dotted circle for combining marks (“indicators”).
- The author mentions that glyph variation is not permitted in Bliss.

- Copyright / licensing for Bliss will need to be sorted before the script can be recommended for encoding. (Debbie Anderson and Jan Kučera is following up with Unicode legal and will relay that information to the proposal author.)

Comments (in part based on comments by Ben Yang):

- On the model: provide pros and cons of atomic encoding, with an example of stacks which would be unreadable for Bliss users.
- Provide the argument for disunification based on behavior, rather than glyph display in cases where you can't rely on a particular font to be specified.
- Provide examples of currency symbol and fraction characters as full Bliss words ("to halve," etc.)
- Include examples with Bliss and Latin, Cyrillic, etc.
 - In such contexts, can the non-Bliss characters take Bliss indicators and/or interact with normal Bliss characters? If so, please give examples.
 - Does the rule about not allowing glyph variation in Bliss also apply to non-Bliss characters (e.g., Latin and Cyrillic)?
- Check on RTL use of Bliss in Israel, particularly for numbers and punctuation, and provide examples. (These examples can then be used by SAH to help decide on how to handle bidi in Bliss.) What is the ordering before and after the decimal point?
 - Provide a table of each character that is visually reversed in RTL contexts along with its reversed form.
 - Provide a list of punctuation marks that require mirroring.
- Consider the option of having the NO-BREAK PUNCTUATION SPACE (¼ space) to be handled by the layout engine and/or the font.
- Show examples of COMMA as a punctuation mark.
- Provide text segmentation properties: line break, grapheme cluster break and word break properties (see [UAX #29](#)).
- The gc property for digits should be Nd and index numbers should be No, as reflected in L2/23-138. However, the entries for UnicodeData.txt for the index characters should have ...;;1;... for the numeric value, while the actual digits will have three values in the fields ...;1;1;1;...
- Move the mapping information on other Bliss standards currently in the names list into a separate data file.
- Bliss users tend to use punctuation marks and number styles that match the typical usage in their culture (i.e., French Bliss users use guillemets). Provide examples.
 - Users who employ guillemets often use single quotation marks, but these are not proposed. How should they be represented?

The above comments have been sent to the author.

19 Kurux Banna

Document: [L2/23-223](#) Preliminary Proposal to Encode the Kurux Banna – Mandal

Action Item for Uma Umamaheswaran, Roadmap Committee: Add Kurux Banna to the Roadmap at the following location: U+16140..U+1618F.

Comments: We reviewed a document asking for a block allocation for Kurux Banna, a script used to write the Kurukh language of India. (Kurukh is also written with Tolong Siki.) Based on some of the evidence, we agreed that the allocation should be granted, noting that allocation does not guarantee encoding. We look forward to a full proposal. The recommended allocation range is U+16140..U+1618F.

Preliminary technical feedback has been sent to the author. Note: A revised version of the proposal has been received, but it has not yet been reviewed by the SAH.

20 Latin: Letters with Overstruck Tilde

Document: [L2/23-262](#) Unicode request for letters with overstruck tilde L2 -- Miller

Comments: We reviewed this proposal for letters with overstruck tilde, but there was no consensus amongst the group members. The use of overstruck tilde is productive, found on consonants and vowels.

In 2003, the UTC approved 11 letters with overstruck tilde ([L2/03-174R2](#)). Should this be taken as precedent for accepting more such characters, or should we consider a different approach, now with 20 years hindsight. If the latter, wouldn't the standard be inconsistent?

If a new set of such characters with overstruck tilde were to be encoded now, they could not be given canonical equivalences to the existing sequences, because of the stability guarantees for normalization. However, in the absence of such canonical equivalences, the problem of dual representations of existing text will arise.

Examples provided in the proposal clearly demonstrate that some text is using sequences with the combining overstruck tilde, despite bad typography. A case may need to be made that these letters with overstruck tilde are distinct units in some orthography, rather than just being base characters with regular, and productive use of a combining diacritic in IPA. A better approach may be to improve IPA-supporting fonts, so that users can depend on properly designed glyphs when using U+0334 COMBINING TILDE OVERLAY.

21 Latin: Small Letter Theta

Document: [L2/23-129](#) Proposal to encode CID+15910 in Adobe-Japan1 as Latin small letter theta – Nozomu Katō

Comments: We reviewed a proposal to encode a Latin small letter theta based on Adobe Japan Set source.

We do not consider Adobe-Japan1 to be an appropriate source, as it is targeting typography rather than interchange and may be overly disunified. In our view, disunifying theta will cause significant disruption. We did not consider vertical writing to be a use case compelling enough to justify such disruption (cf.

the case of lambda, which had consistent usage in the modern orthography of a native language and had a different case pair in Latin and Greek contexts). In addition, the proposal does not provide any textual evidence of the proposed character.

Debbie Anderson has forwarded the comments above to the proposal author.

22 Miao

Document: [L2/23-198](#) Preliminary proposal for additions for Hei Yi to Miao block – Eiso Chan

Comments: We reviewed this preliminary proposal for a standardized variant sequence for U+16F2F MIAO LETTER TSHA adding a dot to the character, and a new character MIAO LETTER YI ZHA, both used in Hei Yi. The document does not provide any rationale for introducing a variation sequence and we felt that might be unnecessary; annotation might be desirable. A stronger rationale is required before a VS is considered. The diversity of existing glyph variances for a given script also needs to be considered.

The new character MIAO LETTER YI ZHA is considered a glyph variant in SIL fonts, though it appears to be a significant glyph difference and may be worth encoding separately. The proposed code point U+16F4B is reasonable. We seek expert input on the encoding of YI ZHA as a separate character.

The proposal author also noted the U+16F33 may need to have its representative glyph revised. However, he is still studying the issue.

Debbie Anderson has forwarded the comments to the proposal author and sent a copy of the proposal to experts to solicit their feedback on separately encoding MIAO LETTER YI ZHA. Chen Zhuang of the Chinese NB has been in contact with Miao experts, who had some comments. Chen Zhuang reports he will forward the feedback to the proposal author.

23 Pabuchi

Document: [L2/23-222](#) Proposal to Encode the Pabuchi Script – Mandal

Comments: Due to the sacred nature of the script, we previously requested letters from the community consenting for this proposal to be made available in a public registry. We were provided with such letters and agreed to submit the document to L2.

However, in general we were not convinced that the script is ready for encoding, mostly because no need for interchange has been demonstrated. While the proposal states that “old people all want to write and preserve this script in digital form”, there is no evidence as such. No printed publications exist, no documents in digital form, and no fonts, hence we see no indication that the script needs to be encoded in Unicode at this time. Note that a script does not need to be encoded in Unicode for digital publications to be produced. We encourage the users to begin typesetting the script in publications.

Technical feedback has been sent to the proposal author.

24 Proto-Elamite

Document: [L2/23-196](#) Proposal to encode Proto-Elamite in Unicode - Pandey

Comments: We briefly reviewed this revised proposal. The author has done significantly more research beyond the 2020 proposal ([L2/20-192](#)). A number of signs need images.

Debbie Anderson has forwarded the proposal to experts for their review.

C. FYI DOCUMENTS

25 African Script Update

Document: [L2/23-203](#) Update on Usage and Implementation Status of African Scripts – Oreen Yousuf, et al.

Comments: This document is FYI to the UTC. It summarizes the current status of various African scripts, grouped by encoded scripts (pp. 1-4) and unencoded scripts (4-14). The current implementation information on encoded scripts is provided. Corrections or comments are encouraged.

26 Balinese

Document: [UTN #51](#) MUSICAL SYMBOLS AND SASAK CHARACTERS IN THE BALINESE SCRIPT -- Aditya Bayu Perdana

Comments: We briefly discussed a draft UTN regarding musical symbols and Sasak characters in the Balinese script, which has been reviewed by Ben Yang and Norbert Lindenberg. We support publishing the content as a single UTN and encourage the author to submit any corrections to the Core Specification that he feels are needed as separate proposals.

This UTN has now been published as [UTN #51](#).

27 Loma

Document: [L2/23-215](#) Progress report on Loma language and script activity – Riley

Comments: This progress report on Loma is FYI to the UTC. Of note is that an email group with Loma speakers has been meeting to discuss outstanding issues regarding the repertoire. A PUA-based font and keyboard have been produced.

28 Mayan Hieroglyphs

Document: [L2/23-228](#) Updated List of Characters for Mayan Codices (supersedes [L2/20-248](#)) -- Carlos Pallán Gayol

Comments: This document corrects an error in L2/20-248 that was discovered in 2023. Because docs from previous years cannot be replaced, this updated list was posted in 2023 document register.

29 Syriac (Christian Palestinian Aramaic)

Document: [UTN #52](#) Christian Palestinian Aramaic Encoding Unicode Technical Note -- Claire Clivaz and Alain J. Desreumaux

Comments: We briefly reviewed this UTN, which was the result of an extended discussions between the proposal authors and members of the Script Ad Hoc. Originally, the authors had proposed Christian Palestinian Aramaic as a separate script. However, it was demonstrated that CPA is essentially the Syriac script and can be handled without the need of any new characters.

The SAH generally was satisfied with the UTN, which provided information on CPA. We recommended a few changes, noted below, which have been incorporated in version 2.

Comments included the following:

- For CPA STAR and CPA CIRCLE, we recommend the following two Unicode characters with gc=Po: U+2055 FLOWER PUNCTUATION MARK and U+2E30 RING POINT;
- Provide the SAH non-modern examples of the two three-dot punctuation characters, to ensure U+2056 and U+205D are the most appropriate;
- Use “CPA Unicode font” in place of “Unicode font”;
- Revise the wording about ZWJ and ZWNJ, since they don’t create or block ligatures (rather, they trigger or block positional forms).

The revised UTN text has now been posted as version 2 of [UTN #52](#).

D. IN PROCESS

Other feedback and script/character topics in process

The following are in process:

- Additions for Aarif Rohingya
- Cyrillic additions for Selkup
- Incung (Kerinci)
- Indian Drum Clef
- Muthanna Kodava
- Feedback on Old Hungarian
- Feedback on Provisionally Assigned Characters' Names (Marín Silva)