

Title: CJK & Unihan Group Recommendations for UTC #172 Meeting

Author: Ken Lunde

Date: 2022-07-21

This document provides the CJK & Unihan Group recommendations for UTC #172 based on a meeting that took place from 6 to 9PM PDT on 2022-07-15, which was attended by Yi Bai, Eiso Chan, Henry Chan, John Jenkins, Ken Lunde, William Nelson, CheonHyeong Sim, Stephan Hyeonjun Stiller, Xieyang Wang, and Yifán Wáng via [Zoom](#). The Chair of the [CJK & Unihan Group](#), Ken Lunde, chaired the meeting with John Jenkins as Vice-Chair.

The CJK & Unihan Group reviewed public feedback and documents that were received since UTC #171. Comments are marked in **green**, and Copy&Paste-ready Recommendations to the UTC are marked in **red**.

PRI #437 Feedback

The three items of [PRI #437](#) (*Proposed Update UAX #38*) feedback that are in this section were discussed by the group, and for convenience, the following data file, which is a PDF attachment, includes the recommended Unihan database changes based on the first item:

- *Unihan-changes-20220715.txt*

The recommended changes are also shown inline, following the Recommendations.

01) 2022-05-06 23:32:11 CDT

Date/Time: Fri May 6 23:32:11 CDT 2022

Name: Night Koo

Report Type: Public Review Issue

Opt Subject: **437**

1. The `kRSUnicode` and `kRSKangXi` of 洑 U+6C77 should be 85.3 instead of 85.4.

Comments: The group discussed this feedback, and agreed that changing the `kRSUnicode` and `kRSKangXi` property values for U+6C77 洑 makes sense, because the source standards sort this particular ideograph among those with either three residual strokes (G3) or six total strokes (T3).

6C77
水 85.4

洑
G3-5334

洑
T3-237E

Recommendations: The group recommends to the UTC the following disposition ⇨

Consensus: Accept the `kRSUnicode` property value change for U+6C77, based on feedback [Fri May 6 23:32:11 CDT 2022] in PRI #437, for Unicode Version 15.0.

Action Item for Michel Suignard, CJK: Change the kRSUnicode property value of U+6C77, based on Section 01 of document L2/22-127, and provide to John Jenkins an updated Unihan15.txt data file, for Unicode Version 15.0.

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the kRSUnicode and kRSKangXi property value changes for U+6C77, based on Section 01 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 01 of document L2/22-127. See feedback [Fri May 6 23:32:11 CDT 2022] in PRI #437.

Current:

U+6C77	kRSKangXi	85.4
U+6C77	kRSUnicode	85.4

Adjusted:

U+6C77	kRSKangXi	85.3
U+6C77	kRSUnicode	85.3

02) 2022-05-10 20:11:32 CDT

Date/Time: Tue May 10 20:11:32 CDT 2022

Name: Kushim Jiang

Report Type: Public Review Issue

Opt Subject: **437**

In UAX #38 > 4 The Fields > 4.1 Alphabetical Listing > kIRG_MSource > Description, the string "MCSCS" should be changed to "MSCS".

Comments: The group discussed this feedback, and agreed that this error, which is likely a typo, should be corrected. MSCS is an abbreviation for *Macao Supplementary Character Set*.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, EDC: Change MCSCS to MSCS in the Description of the kIRG_MSource property in Section 4.1 of UAX #38, based on Section 02 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 02 of document L2/22-127. See feedback [Tue May 10 20:11:32 CDT 2022] in PRI #437.

03) 2022-05-26 11:04:49 CDT

Date/Time: Thu May 26 11:04:49 CDT 2022

Name: John Jenkins

Report Type: Public Review Issue

Opt Subject: **437**

The `kCihaiT` field is misclassified. It is currently in the Dictionary-Like Data category, but it's an index into a dictionary and so should be in the Dictionary Index category.

Comments: The group discussed this feedback, and agreed that the category of the `kCihaiT` property should be changed from “Dictionary-like Data” to “Dictionary Indices.”

Recommendations: The group recommends to the UTC the following disposition ⇨

Consensus: Accept the category change for the `kCihaiT` property, from “Dictionary-like Data” to “Dictionary Indices,” based on feedback [Thu May 26 11:04:49 CDT 2022] in PRI #437, for Unicode Version 15.0.

Action Item for John Jenkins, EDC: Change the category of the `kCihaiT` property from “Dictionary-like Data” to “Dictionary Indices,” which involves moving the property values from the `Unihan_DictionaryLikeData.txt` file to the `Unihan_DictionaryIndices.txt` file, along with making appropriate changes in Sections 4.1 and 4.3 of UAX #38 and in Section 7 of UAX #44, based on Section 03 of document L2/22-127, for Unicode Version 15.0.

PRI #442 Feedback

The single item of [PRI #442](#) (*Unicode 15.0 Alpha Review*) feedback that is in this section, which is associated with UTC Action Item [171-A132](#), was discussed by the group, and for convenience, the following data file, which is a PDF attachment, includes the recommended Unihan database additions based on it:

- *Unihan-additions-20220715.txt*

The recommended additions are also shown inline, following the Recommendations.

04) 2022-04-17 12:19:45 CDT

Date/Time: Sun Apr 17 12:19:45 CDT 2022

Name: extc

Report Type: Public Review Issue

Opt Subject: **PRI #442**

2 characters of CJK Extension H are unifiable with existing CJK United Ideographs.

The first one is U+31F4C 𠮿, which is unifiable with U+2CECB 𠮿 = 𠮿

Both characters are short form of 菩提 used in Buddhist scriptures. They are identical in meaning and unifiable variants.

The second one is U+31F68 𠄎邦, which is unifiable with U+26C25 𠄎 = 𠄎𠄎𠄎 because 𠄎𠄎 is a variant of 邦 which you can find in Unicode Ideographic Variation Database.

(U+90A6 U+E0101).

Please consider these 2 cases, thank you.

Comments: The group discussed this feedback, which was submitted only two days before the UTC #171 meeting and was therefore not discussed by this group during its 2022-04-08 meeting, and agreed that it is simply too late to remove these two Extension H ideographs, particularly because characters cannot be removed after the Beta Review period begins. Furthermore, there is a requirement in the UCD data file, *UnicodeData.txt*, that CJK Unified Ideograph blocks have contiguous code point ranges, so any suggestion that involves leaving the two code points empty is a complete non-starter. Lastly, there is not general agreement among IRG experts that these two Extension H ideographs should be unified with existing ideographs. The group therefore recommends that these two ideographs be kept, and that the *kZVariant* property be used to associate them with the existing Extension B (U+26C25 𠄎) and Extension F (U+2CECB 𠄎) ideographs.

Furthermore, Japan made similar CDAM ballot comments about these two ideographs, but based on the disposition on pp 7 and 8 of [WG2 N5194](#), Japan changed its vote to positive (see the very last line of page 8). In other words, SC2 is expecting that these two ideographs will be included in Extension H for Unicode Version 15.0.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the *kZVariant* property value additions for U+26C25, U+2CECB, U+31F4C, and U+31F68, based on Section 04 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 04 of document L2/22-127. See feedback [Sun Apr 17 12:19:45 CDT 2022] in PRI #442.

New:

U+26C25	kZVariant	U+31F68
U+2CECB	kZVariant	U+31F4C
U+31F4C	kZVariant	U+2CECB
U+31F68	kZVariant	U+26C25

PRI #445 Feedback

The single item of [PRI #445](#) (*Proposed Update UAX #45*) feedback that is in this section was discussed by the group.

05) 2022-05-15 08:16:57 CDT

Date/Time: Sun May 15 08:16:57 CDT 2022

Name: Ken Lunde

Report Type: Public Review Issue

Opt Subject: **445**

Please consider the following three UAX #45 suggestions:

1) At some point in the future, the single-letter status field identifiers (aka Field 1) for CJK Unified Ideographs extensions will collide with other single-letter status field identifiers, the first being N, which indicates that the ideograph is planned to be submitted for a future extension. I therefore suggest that the following single-letter status field identifiers be changed as follows:

A → ExtA

B → ExtB

C → ExtC

D → ExtD

E → ExtE

F → ExtF

G → ExtG

H → ExtH

U → URO

2) In order to highlight status field identifiers "N" (Earmarked to be included in a proposal from the UTC to the IRG for a future extension), "W" (Not suitable for encoding as a CJK Unified Ideograph), and "X" (Appropriate disposition has not been determined) for easier identification, I suggest that they be changed to characters that display as emoji:

N →  (U+2705 WHITE HEAVY CHECK MARK)

W →  (U+274C CROSS MARK)

X →  (U+2753 BLACK QUESTION MARK ORNAMENT)

Of course, the second suggestion makes the purpose of the first suggestion moot. However, there is still a benefit of the first suggestion: the affected status field identifiers are more explicit.

3) I noticed that the description of Field 2 in the header of USourceData.txt doesn't really match the descriptions in the table in Section 2.1 of UAX #45 itself:

```
# If the status is V (Field 1), the code point in Field 2 specifies
# the encoded character for which this entry is a variant. Otherwise, the
# code point specifies the encoded character for this entry.
```

The table in Section 2.1 of UAX #45 states that the same is true of other status field values, such as N, W, X, and so on. Perhaps the following is a more accurate description:

The code point in Field 2 specifies the encoded character for this entry. Otherwise, the code point specifies the encoded character to which this entry is related, generally as a variant.

That is all.

Comments: The group discussed this feedback, and agreed that all three suggested UAX #45 data file changes are reasonable, the first two of which also need to be reflected in UAX #45 proper. Furthermore, the group particularly liked the suggestion to use emoji that display in color to readily highlight ideographs that currently have status values of N, W, or X, the first of which is the most likely to change.

Recommendations: The group recommends to the UTC the following disposition ⇨

Consensus: Accept the suggested UAX #45 data file changes, based on feedback [Sun May 15 08:16:57 CDT 2022] in PRI #445 and Section 05 of document L2/22-127, for Unicode Version 15.0.

Action Item for John Jenkins, EDC: Update the UAX #45 data file and UAX #45 proper to reflect the three suggested changes, based on Section 05 of document L2/22-127, for Unicode Version 15.0.

PRI #453 Feedback

The three items of [PRI #453](#) (*Unicode 15.0 Beta Review*) feedback that are in this section were discussed by the group, and for convenience, the following data files, all of which are PDF attachments, include all of the recommended Unihan database changes and removals based on them:

- *Unihan-changes-20220715.txt*
- *Unihan-removals-20220715.txt*

The recommended changes are also shown inline, following the Recommendations.

06) 2022-06-29 22:48:06 CDT

Date/Time: Wed Jun 29 22:48:06 CDT 2022

Name: Jaycee Carter

Report Type: Error Report

Opt Subject: **CJK Extension A, B & D**

The following CJK characters have incorrect figures for the `kTotalStrokes` field:

Radical 211:

U+2A5F1 should be 17 (not 20).

U+2A602 should be 18 (not 21).

U+2A61A should be 19 (not 22).

U+2B81A should be 17 (not 13).

All four contain the radical 211 variant 齒 (U+6B6F), which has 12 strokes. It appears that the total stroke counts for U+2A5F1, U+2A602 and U+2A61A were incorrectly calculated from the stroke count of 齒 (U+9F52), which is 15. On the other hand, U+2B81A appears to have been incorrectly calculated from the stroke count of 齒 (U+9F7F), which is 8.

Radical 212:

U+4DAD should be 9 (not 20).

U+4DAE should be 9 (not 20).

U+2B732 should be 11 (not 15).

All three contain the simplified form of radical 212 龙 (U+9F99), which has 5 strokes. Again, it appears that the total stroke counts for U+4DAD and U+4DAE were incorrectly calculated from the stroke count of 龍 (U+9F8D), which is 16. However, it is not clear how the incorrect figure of 15 was reached for U+2B732.

Radical 213:

U+2B81D should be 23 (not 28).

U+2B81D contains the radical 213 variant 龜 (U+4E80), which has 11 strokes. It appears that the total stroke count was incorrectly calculated from the stroke count of 龜 (U+9F9C), which is 16 in mainland China.

Comments: The group discussed this feedback, and agreed that all eight suggested *kTotalStrokes* property value changes are appropriate. For reference, and for the benefit and convenience of those who enjoy counting strokes, the following are code chart excerpts for the eight ideographs, in increasing code point order, whose *kTotalStrokes* values should be changed per this feedback:

4DAD
龙 212.4
𪗇
GS-242E

4DAE
龙 212.4
𪗈
G7-2227

2A5F1
齒 211.5
𪗉
J4-7E6E

2A602
齒 211.6
𪗊 𪗋
J4-7E70 VU-2A602

2A61A
齒 211.7
𪗌
J4-7E72

2B732
龙 212.6
虢
GZFY-00495

2B81A
齒 211.5
齣
UTC-00859

2B81D
龜 213.12
鼈
JH-JTC0B0

Recommendations: The group recommends to the UTC the following disposition ⇨

Consensus: Accept the eight kTotalStrokes property value changes, based on feedback [Wed Jun 29 22:48:06 CDT 2022] in PRI #453 and Section 06 of document L2/22-127, for Unicode Version 15.0.

Action Item for Michel Suignard, CJK: Apply the eight kTotalStrokes property value changes, based on Section 06 of document L2/22-127, and provide to John Jenkins an updated Unihan15.txt data file, for Unicode Version 15.0.

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the eight kTotalStrokes property value changes, based on Section 06 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 06 of document L2/22-127. See feedback [Wed Jun 29 22:48:06 CDT 2022] in PRI #453.

Current:

U+4DAD	kTotalStrokes	20
U+4DAE	kTotalStrokes	20
U+2A5F1	kTotalStrokes	20
U+2A602	kTotalStrokes	21
U+2A61A	kTotalStrokes	22
U+2B732	kTotalStrokes	15
U+2B81A	kTotalStrokes	13
U+2B81D	kTotalStrokes	28

Adjusted:

U+4DAD	kTotalStrokes	9
U+4DAE	kTotalStrokes	9
U+2A5F1	kTotalStrokes	17
U+2A602	kTotalStrokes	18
U+2A61A	kTotalStrokes	19
U+2B732	kTotalStrokes	11
U+2B81A	kTotalStrokes	17
U+2B81D	kTotalStrokes	23

07) 2022-07-03 08:33:28 CDT

Date/Time: Sun Jul 3 08:33:28 CDT 2022

Name: Jaycee Carter

Report Type: Error Report

Opt Subject: **Unihan_DictionaryIndices.txt**

Two CJK characters have incorrect values for *kDaeJaweon*:

U+66C3 should be 0870.050 (not 0080.050)

U+880A should be 1564.070 (not 0564.070)

Comments: The group discussed this feedback, and agreed that the suggested *kDaeJaweon* property value changes for U+66C3 𨮑 and U+880A 𨮑 are correct. Although no one in the group owns—or has access to—the particular edition of the dictionary in question, the current values were deemed incorrect by inspecting the surrounding ideographs with the correct page number values, along with the relative position of the two ideographs on the correct page:

U+**66C3** (0080.050 → 0870.**050**):

U+66A8	kDaeJaweon	0870.030
U+66C0	kDaeJaweon	0870.010
U+ 66C2	kDaeJaweon	0870. 040
U+ 66C4	kDaeJaweon	0870. 060
U+66C6	kDaeJaweon	0870.080
U+66C7	kDaeJaweon	0870.090
U+66C8	kDaeJaweon	0870.110
U+66C9	kDaeJaweon	0870.120
U+66CE	kDaeJaweon	0870.170
U+66CF	kDaeJaweon	0870.180
U+66D0	kDaeJaweon	0870.190
U+66D1	kDaeJaweon	0870.200
U+66D2	kDaeJaweon	0870.230

U+**880A** (0564.070 → 1564.**070**):

U+8807	kDaeJaweon	1564.010
U+8808	kDaeJaweon	1564.020
U+ 8809	kDaeJaweon	1564. 050
U+ 880B	kDaeJaweon	1564. 080
U+880D	kDaeJaweon	1564.110
U+880E	kDaeJaweon	1564.130
U+8810	kDaeJaweon	1564.250
U+8811	kDaeJaweon	1564.270
U+8812	kDaeJaweon	1564.290
U+8813	kDaeJaweon	1564.310
U+8814	kDaeJaweon	1564.330
U+8815	kDaeJaweon	1564.340
U+8816	kDaeJaweon	1564.370
U+8817	kDaeJaweon	1564.390
U+8818	kDaeJaweon	1564.380

For future reference, Lee Collins has in his personal library the particular edition of this dictionary.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the kDaeJaweon property value changes for U+66C3 and U+880A, based on Section 07 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 07 of document L2/22-127. See feedback [Sun Jul 3 08:33:28 CDT 2022] in PRI #453.

Current:

U+66C3	kDaeJaweon	0080.050
U+880A	kDaeJaweon	0564.070

Adjusted:

U+66C3	kDaeJaweon	0870.050
U+880A	kDaeJaweon	1564.070

08) 2022-07-03 10:50:44 CDT

Date/Time: Sun Jul 3 10:50:44 CDT 2022

Name: Jaycee Carter

Report Type: Error Report

Opt Subject: **Unihan_DictionaryIndices.txt**

The following compatibility ideographs have dictionary indices that are not possible to interpret, which should be removed:

kDaeJaweon: 1 character

U+F941 kDaeJaweon 0198.000

kKangXi: 30 characters

U+F90A kKangXi 0000.090

U+F90B kKangXi 0000.090

U+F90C kKangXi 0000.090

U+F90D kKangXi 0000.090

U+F90E kKangXi 0000.090

U+F90F kKangXi 0000.090

U+F910 kKangXi 0000.910

U+F911 kKangXi 0000.911

U+F91A kKangXi 0000.091

U+F91B kKangXi 0000.091

U+F91C kKangXi 0000.091

U+F91D kKangXi 0000.091

U+F91E kKangXi 0000.091

U+F91F kKangXi 0000.091

U+F920 kKangXi 0000.920

U+F921 kKangXi 0000.921

U+F930 kKangXi 0000.930
U+F931 kKangXi 0000.931
U+F940 kKangXi 0000.940
U+F941 kKangXi 0000.941
U+F950 kKangXi 0000.950
U+F951 kKangXi 0000.951
U+F960 kKangXi 0000.960
U+F961 kKangXi 0000.961
U+F970 kKangXi 0000.970
U+F971 kKangXi 0000.971
U+F980 kKangXi 0000.980
U+F981 kKangXi 0000.981
U+F990 kKangXi 0000.990
U+F991 kKangXi 0000.991
kMorohashi: 302 characters
U+F900 kMorohashi 00000
U+F901 kMorohashi 00000
U+F902 kMorohashi 00000
U+F903 kMorohashi 00000
U+F904 kMorohashi 00000
U+F905 kMorohashi 00000
U+F906 kMorohashi 00000
U+F907 kMorohashi 00000
U+F908 kMorohashi 00000
U+F909 kMorohashi 00000
U+F90A kMorohashi 00000
U+F90B kMorohashi 00000
U+F90C kMorohashi 00000
U+F90D kMorohashi 00000
U+F90E kMorohashi 00000
U+F90F kMorohashi 00000
U+F910 kMorohashi 00000
U+F911 kMorohashi 00000
U+F912 kMorohashi 00000
U+F913 kMorohashi 00000
U+F914 kMorohashi 00000
U+F915 kMorohashi 00000
U+F916 kMorohashi 00000
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U+F918 kMorohashi 00000
U+F919 kMorohashi 00000
U+F91A kMorohashi 00000
U+F91B kMorohashi 00000
U+F91C kMorohashi 00000
U+F91D kMorohashi 00000
U+F91E kMorohashi 00000
U+F91F kMorohashi 00000
U+F920 kMorohashi 00000
U+F921 kMorohashi 00000
U+F922 kMorohashi 00000
U+F923 kMorohashi 00000
U+F924 kMorohashi 00000
U+F925 kMorohashi 00000
U+F926 kMorohashi 00000
U+F927 kMorohashi 00000
U+F928 kMorohashi 00000
U+F929 kMorohashi 00000
U+F92A kMorohashi 00000
U+F92B kMorohashi 00000
U+F92C kMorohashi 00000
U+F92D kMorohashi 00000
U+F92E kMorohashi 00000
U+F92F kMorohashi 00000
U+F930 kMorohashi 00000
U+F931 kMorohashi 00000
U+F932 kMorohashi 00000
U+F933 kMorohashi 00000
U+F934 kMorohashi 00000
U+F935 kMorohashi 00000
U+F936 kMorohashi 00000
U+F937 kMorohashi 00000
U+F938 kMorohashi 00000
U+F939 kMorohashi 00000
U+F93A kMorohashi 00000
U+F93B kMorohashi 00000
U+F93C kMorohashi 00000
U+F93D kMorohashi 00000
U+F93E kMorohashi 00000

U+F93F kMorohashi 00000
U+F940 kMorohashi 00000
U+F941 kMorohashi 00000
U+F942 kMorohashi 00000
U+F943 kMorohashi 00000
U+F944 kMorohashi 00000
U+F945 kMorohashi 00000
U+F946 kMorohashi 00000
U+F947 kMorohashi 00000
U+F948 kMorohashi 00000
U+F949 kMorohashi 00000
U+F94A kMorohashi 00000
U+F94B kMorohashi 00000
U+F94C kMorohashi 00000
U+F94D kMorohashi 00000
U+F94E kMorohashi 00000
U+F94F kMorohashi 00000
U+F950 kMorohashi 00000
U+F951 kMorohashi 00000
U+F952 kMorohashi 00000
U+F953 kMorohashi 00000
U+F954 kMorohashi 00000
U+F955 kMorohashi 00000
U+F956 kMorohashi 00000
U+F957 kMorohashi 00000
U+F958 kMorohashi 00000
U+F959 kMorohashi 00000
U+F95A kMorohashi 00000
U+F95B kMorohashi 00000
U+F95C kMorohashi 00000
U+F95D kMorohashi 00000
U+F95E kMorohashi 00000
U+F95F kMorohashi 00000
U+F960 kMorohashi 00000
U+F961 kMorohashi 00000
U+F962 kMorohashi 00000
U+F963 kMorohashi 00000
U+F964 kMorohashi 00000
U+F965 kMorohashi 00000

U+F966 kMorohashi 00000
U+F967 kMorohashi 00000
U+F968 kMorohashi 00000
U+F969 kMorohashi 00000
U+F96A kMorohashi 00000
U+F96B kMorohashi 00000
U+F96C kMorohashi 00000
U+F96D kMorohashi 00000
U+F96E kMorohashi 00000
U+F96F kMorohashi 00000
U+F970 kMorohashi 00000
U+F971 kMorohashi 00000
U+F972 kMorohashi 00000
U+F973 kMorohashi 00000
U+F974 kMorohashi 00000
U+F975 kMorohashi 00000
U+F976 kMorohashi 00000
U+F977 kMorohashi 00000
U+F978 kMorohashi 00000
U+F979 kMorohashi 00000
U+F97A kMorohashi 00000
U+F97B kMorohashi 00000
U+F97C kMorohashi 00000
U+F97D kMorohashi 00000
U+F97E kMorohashi 00000
U+F97F kMorohashi 00000
U+F980 kMorohashi 00000
U+F981 kMorohashi 00000
U+F982 kMorohashi 00000
U+F983 kMorohashi 00000
U+F984 kMorohashi 00000
U+F985 kMorohashi 00000
U+F986 kMorohashi 00000
U+F987 kMorohashi 00000
U+F988 kMorohashi 00000
U+F989 kMorohashi 00000
U+F98A kMorohashi 00000
U+F98B kMorohashi 00000
U+F98C kMorohashi 00000

U+F98D kMorohashi 00000
U+F98E kMorohashi 00000
U+F98F kMorohashi 00000
U+F990 kMorohashi 00000
U+F991 kMorohashi 00000
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U+F993 kMorohashi 00000
U+F994 kMorohashi 00000
U+F995 kMorohashi 00000
U+F996 kMorohashi 00000
U+F997 kMorohashi 00000
U+F998 kMorohashi 00000
U+F999 kMorohashi 00000
U+F99A kMorohashi 00000
U+F99B kMorohashi 00000
U+F99C kMorohashi 00000
U+F99D kMorohashi 00000
U+F99E kMorohashi 00000
U+F99F kMorohashi 00000
U+F9A0 kMorohashi 00000
U+F9A1 kMorohashi 00000
U+F9A2 kMorohashi 00000
U+F9A3 kMorohashi 00000
U+F9A4 kMorohashi 00000
U+F9A5 kMorohashi 00000
U+F9A6 kMorohashi 00000
U+F9A7 kMorohashi 00000
U+F9A8 kMorohashi 00000
U+F9A9 kMorohashi 00000
U+F9AA kMorohashi 00000
U+F9AB kMorohashi 00000
U+F9AC kMorohashi 00000
U+F9AD kMorohashi 00000
U+F9AE kMorohashi 00000
U+F9AF kMorohashi 00000
U+F9B0 kMorohashi 00000
U+F9B1 kMorohashi 00000
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U+F9BA kMorohashi 00000
U+F9BB kMorohashi 00000
U+F9BC kMorohashi 00000
U+F9BD kMorohashi 00000
U+F9BE kMorohashi 00000
U+F9BF kMorohashi 00000
U+F9C0 kMorohashi 00000
U+F9C1 kMorohashi 00000
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U+F9C8 kMorohashi 00000
U+F9C9 kMorohashi 00000
U+F9CA kMorohashi 00000
U+F9CB kMorohashi 00000
U+F9CC kMorohashi 00000
U+F9CD kMorohashi 00000
U+F9CE kMorohashi 00000
U+F9CF kMorohashi 00000
U+F9D0 kMorohashi 00000
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U+F9DE kMorohashi 00000
U+F9DF kMorohashi 00000
U+F9E0 kMorohashi 00000
U+F9E1 kMorohashi 00000
U+F9E2 kMorohashi 00000
U+F9E3 kMorohashi 00000
U+F9E4 kMorohashi 00000
U+F9E5 kMorohashi 00000
U+F9E6 kMorohashi 00000
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U+F9E8 kMorohashi 00000
U+F9E9 kMorohashi 00000
U+F9EA kMorohashi 00000
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U+F9F8 kMorohashi 00000
U+F9F9 kMorohashi 00000
U+F9FA kMorohashi 00000
U+F9FB kMorohashi 00000
U+F9FC kMorohashi 00000
U+F9FD kMorohashi 00000
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U+FA0A kMorohashi 00000
U+FA0B kMorohashi 00000
U+FA0C kMorohashi 00000
U+FA0D kMorohashi 00000
U+FA0E kMorohashi 00000
U+FA0F kMorohashi 00000
U+FA10 kMorohashi 00000
U+FA11 kMorohashi 00000
U+FA12 kMorohashi 00000
U+FA13 kMorohashi 00000
U+FA14 kMorohashi 00000
U+FA15 kMorohashi 00000
U+FA16 kMorohashi 00000
U+FA17 kMorohashi 00000
U+FA18 kMorohashi 00000
U+FA19 kMorohashi 00000
U+FA1A kMorohashi 00000
U+FA1B kMorohashi 00000
U+FA1C kMorohashi 00000
U+FA1D kMorohashi 00000
U+FA1E kMorohashi 00000
U+FA1F kMorohashi 00000
U+FA20 kMorohashi 00000
U+FA21 kMorohashi 00000
U+FA22 kMorohashi 00000
U+FA23 kMorohashi 00000
U+FA24 kMorohashi 00000
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U+FA26 kMorohashi 00000
U+FA27 kMorohashi 00000
U+FA28 kMorohashi 00000

U+FA29 kMorohashi 00000
U+FA2A kMorohashi 00000
U+FA2B kMorohashi 00000
U+FA2C kMorohashi 00000
U+FA2D kMorohashi 00000

Comments: The group discussed this feedback, and agreed that all of the listed property values should be removed, because they are meaningless.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, CJK: Update the Unihan database to remove kDaeJaweon (1), kKangXi (30), and kMorohashi (302) property values, based on Section 08 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 08 of document L2/22-127. See feedback [Sun Jul 3 10:50:44 CDT 2022] in PRI #453.

Public Feedback

The single item of public feedback from [L2/22-123](#) that is in this section was discussed by the group, and for convenience, the following data file, which is a PDF attachment, includes the recommended Unihan database changes based on it:

- *Unihan-changes-20220715.txt*

The recommended changes are also shown inline, following the Recommendations.

09) 2022-05-04 02:13:35 CDT

Date/Time: Wed May 4 02:13:35 CDT 2022

Name: Jaemin Chung

Report Type: Error Report

Opt Subject: **Radical-stroke value for U+2C4F8**

The radical-stroke value for U+2C4F8 𪗗 should be changed from the current 115.10 (radical 禾) to 202.3 (radical 黍).

cf. U+4D58 𪗗 202.9

Comments: The group discussed this feedback, and agreed with the proposed *kRSUnicode* property change for U+2C4F8 𪗗. The group further recommends that 202.7 and 202.14 be added as additional *kRSUnicode* property values for U+246FF 𪗗 and U+2A1FA 𪗗, respectively. Radical #202 (黍) is easily overlooked, because its top component is identical to Radical #115 (禾).

246FF 牛 93.15	𪛗 GKX-0705.05	𪛗 T7-4773
2A1FA 鳥 196.15	𪛘 GKX-1504.13	𪛘 T7-633D
2C4F8 禾 115.10	𪛙 GZFY-00289	

Recommendations: The group recommends to the UTC the following disposition ⇨

Consensus: Accept the kRSUnicode property value changes for U+246FF, U+2A1FA, and U+2C4F8, based on feedback [Wed May 4 02:13:35 CDT 2022] in document L2/22-123 and as amended in Section 09 of document L2/22-127, for Unicode Version 15.0.

Action Item for Michel Suignard, CJK: Apply the three kRSUnicode property value changes, based on Section 09 of document L2/22-127, and provide to John Jenkins an updated Unihan15.txt data file, for Unicode Version 15.0.

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the three kRSUnicode property value changes, based on Section 09 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the feedback submitter the CJK & Unihan Group comments in Section 09 of document L2/22-127. See feedback [Wed May 4 02:13:35 CDT 2022] in document L2/22-123.

Current:

U+246FF	kRSUnicode	93.15
U+2A1FA	kRSUnicode	196.15
U+2C4F8	kRSUnicode	115.10

Adjusted:

U+246FF	kRSUnicode	93.15	202.7
U+2A1FA	kRSUnicode	196.15	202.14
U+2C4F8	kRSUnicode	202.3	

UAX #38 / Unihan Database Documents

The documents in this section were discussed by the group, and for convenience, the following data files, all of which are PDF attachments, include all of the recommended Unihan database additions based on them:

- *Unihan-additions-20220715.txt*
- *kMandarin-changes-20220715.txt*

With the exception of *kMandarin* property value changes, the recommended Unihan database additions are also shown inline, following the Recommendations.

10) L2/22-111: Unihan Numeric Fields Problems and Proposed Updates

Comments: The group discussed this proposal, which includes suggested changes, additions, and removals of *kOtherNumeric* and *kPrimaryNumeric* property values. The group also discussed the possibility of allowing either the use of commas or an exponent notation to improve the readability of property values that may include a large number of zeros, such as U+5146 兆 whose *kPrimaryNumeric* property value, 1000000000000, could be expressed as 1,000,000,000,000 or 10e12. The group concluded that the descriptions of these properties, along with that of *kAccountingNumeric*, are sufficiently unclear, and should be revised accordingly, which may include relaxing the constraint that they have no overlap, because some of the proposed property values would benefit from such overlap. For the benefit of the UTC, the following are the current descriptions of these properties in UAX #38:

kAccountingNumeric: *The value of the character when used in the writing of accounting numerals. Accounting numerals are used in East Asia to prevent fraud. Because a number like ten (十) is easily turned into one thousand (千) with a stroke of a brush, monetary documents will often use an accounting form of the numeral ten (such as 拾) in their place. The three numeric-value fields should have no overlap; that is, characters with a kAccountingNumeric value should not have a kPrimaryNumeric or kOtherNumeric value as well.*

kOtherNumeric: *The numeric value for the character in certain unusual, specialized contexts. The three numeric-value fields should have no overlap; that is, characters with a kOtherNumeric value should not have a kAccountingNumeric or kPrimaryNumeric value as well.*

kPrimaryNumeric: *The value of the character when used in the writing of numbers in the standard fashion. The three numeric-value fields should have no overlap; that is, characters with a kPrimaryNumeric value should not have a kAccountingNumeric or kOtherNumeric value as well.*

The group also noted that the ideographs in Sections 2.2 and 2.3 of L2/22-111 may benefit from new provisional Unihan database properties, such as *kVietnameseNumeric* and *kZhuangNumeric*, respectively.

Although raised during the review of this document, the *kAccountingNumeric*, *kOtherNumeric*, and *kPrimaryNumeric* properties are referenced by the UCD. See the *Numeric_Type* property in [Table 9, Property Table](#), of UAX #44. Therefore, care must be taken if overlap is allowed, to include allowing multiple property values, defining any new Unihan database properties, and any use of commas or an exponent notation.

The proposal authors were in the group, were present at the meeting, and have sufficient feedback from the group to prepare an updated proposal in the future.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, EDC: Revise the descriptions of the *kAccountingNumeric*, *kOtherNumeric*, and *kPrimaryNumeric* properties in UAX #38 to make their purposes clearer, based on document L2/22-111 and Section 10 of document L2/22-127, for Unicode Version 15.0.

Action Item for Markus Scherer, PAG: Determine whether UAX #44 would be impacted by either relaxing the constraint that the `kAccountingNumeric`, `kOtherNumeric`, and `kPrimaryNumeric` properties have no overlap, by allowing multiple property values, or by allowing commas or an exponent notation to improve the readability of property values that include a large number of zeros, then report back to the UTC. See document L2/22-111 and Section 10 of document L2/22-127.

11) L2/22-112: Proposed Changes to the Unihan Database's `kMandarin` Field

Comments: The group reviewed this proposal, which includes 10 `kMandarin` property value changes, which will need to be checked by the CLDR-TC prior to adding to the Unihan database. The group noted that the proposed `kMandarin` property value change for U+927B 銘 was ambiguous, and concluded that `gè` would be the preferred property value.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for Peter Edberg, CJK: Ask the CLDR-TC to check the proposed `kMandarin` property value changes, then report back to the UTC. See document L2/22-112 and Section 11 of document L2/22-127.

12) L2/22-133: New candidates of Unihan `kSpooftingVariant` and `kZVariant`

Comments: The group reviewed this proposal, which includes suggested `kSpooftingVariant` and `kZVariant` property value additions. The group noted that two of the pairs—U+9038 逸/U+284DC 逸 and U+9686 隆/U+28E93 隆—should be handled via the `kZVariant` property, not the `kSpooftingVariant` property. Everything else made sense to the group, and Ken Lunde noted the suggested `kStrange` addition that he will include in a forthcoming proposal.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for John Jenkins, CJK: Update the Unihan database to reflect the `kSpooftingVariant` and `kZVariant` property value additions, based on document L2/22-133 and as amended in Section 12 of document L2/22-127, for Unicode Version 15.0.

Action Item for Ken Lunde, CJK: Convey to the author of document L2/22-133 the CJK & Unihan Group comments in Section 12 of document L2/22-127.

New:

U+4E86	<code>kSpooftingVariant</code>	U+20110
U+4E8C	<code>kSpooftingVariant</code>	U+2011E U+2011F U+20120
U+5175	<code>kSpooftingVariant</code>	U+2050A
U+5341	<code>kSpooftingVariant</code>	U+2C09B
U+53F1	<code>kSpooftingVariant</code>	U+2B738
U+5929	<code>kSpooftingVariant</code>	U+2BBDB
U+5EF6	<code>kSpooftingVariant</code>	U+2231B
U+7530	<code>kSpooftingVariant</code>	U+2BB42
U+76EE	<code>kSpooftingVariant</code>	U+211A4
U+7DD2	<code>kZVariant</code>	U+7DD6
U+7DD6	<code>kZVariant</code>	U+7DD2

U+8A00	kSemanticVariant	U+8A01
U+8A01	kSemanticVariant	U+8A00
U+8B20	kZVariant	U+8B21
U+8B21	kZVariant	U+8B20
U+9038	kZVariant	U+284DC
U+9686	kZVariant	U+28E93
U+20110	kSpoofingVariant	U+4E86
U+2011E	kSpoofingVariant	U+4E8C U+2011F U+20120
U+2011F	kSpoofingVariant	U+4E8C U+2011E U+20120
U+20120	kSpoofingVariant	U+4E8C U+2011E U+2011F
U+2050A	kSpoofingVariant	U+5175
U+20B9F	kSpoofingVariant	U+2B738
U+211A4	kSpoofingVariant	U+76EE
U+2231B	kSpoofingVariant	U+5EF6
U+284DC	kZVariant	U+9038
U+28E93	kZVariant	U+9686
U+2B738	kSpoofingVariant	U+53F1 U+20B9F
U+2BB42	kSpoofingVariant	U+7530
U+2BBDB	kSpoofingVariant	U+5929
U+2C09B	kSpoofingVariant	U+5341

13) L2/22-135: Preliminary proposal to add kFanqie to Unihan Database

Comments: The group reviewed this preliminary proposal to add a new provisional *kFanqie* property to the Unihan database. The group understands that a Fanqie sequence consists of two ideographs that specify an ideograph’s reading, followed by U+53CD 反 or U+5207 切, which are interchangeable and therefore not included as part of the property value. In terms of the first two ideographs of a Fanqie sequence, it would be helpful to know about any constraints, such as whether all possible values would be restricted to the URO (U+4E00..U+9FFF) or whether any CJK Unified Ideograph could be potentially used. This would influence the property’s Syntax (aka regular expression). In addition, the group noted that several property values in the data file that is attached to the preliminary proposal include two or more property values, but the preliminary proposal does not explain this. Lastly, the actual proposal will need to include everything that would be included in the property’s entry in Section 4.1 of UAX #38, specifically its Status (*Provisional*), Category (*Readings*), Delimiter (*space*), Syntax, and Description. Depending on the scope of the property values, the following are Syntax examples for the proposal author to consider:

URO-only:

```
[\x{4E00}-\x{9FFF}]{2}
```

Any CJK Unified Ideograph:

```
[\x{3400}-\x{4DBF}\x{4E00}-\x{9FFF}\x{FA0E}\x{FA0F}\x{FA11}\x{FA13}\x{FA14}\x{FA1F}\x{FA21}\x{FA23}\x{FA24}\x{FA27}-\x{FA29}\x{20000}-\x{2FFFFD}\x{30000}-\x{3FFFFD}]{2}
```

The proposal author was in the group, was present at the meeting, and has sufficient feedback from the group to prepare a final proposal in the future.

Recommendations: The group recommends to the UTC the following disposition ⇒

No UTC action is required.

Other Documents & Topics

14) L2/22-115: Annotations for CJK strokes used as Hangul strokes L2/22-137: Feedback on Hangul Strokes

Comments: The group reviewed this proposal, along with its feedback in document L2/22-137. The group largely agreed with the feedback in L2/22-137, but felt it prudent to solicit feedback from the China National Body before the UTC passes final judgement.

The group noted that the characters in the [CJK Strokes](#) block were specifically designed to accommodate CJK Unified Ideographs. Although some scripts may appear to be constructed using characters in the CJK Strokes block, it does not necessarily mean that members of the user community think in those terms, or even has well-understood names for them. At least, that appears to be the case for Hangul. One question to consider is where does one stop if going beyond CJK Unified Ideographs, especially considering that the characters of all scripts are fundamentally made up of strokes? One member of the group believes that the correct answer is to simply not start. Lastly, the proposed *Script_Extensions* property value additions should be reviewed by the Script Ad Hoc Group.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for Ken Lunde, CJK: Forward documents L2/22-115 and L2/22-137 to CHEN Zhuang (HOD, China National Body) for the purpose of soliciting feedback, in terms of confirming that the hangul strokes are used and needed for China.

Action Item for Deborah Anderson, SAH: Review the proposed *Script_Extensions* property value additions in L2/22-115, then report back to the UTC.

Action Item for Ken Lunde, CJK: Convey to the author of document L2/22-137 the CJK & Unihan Group comments in Section 14 of document L2/22-127.

15) L2/22-136: Feedback on Proposals to Encode New Ideographic Description Characters

Comments: The group reviewed this document, which is effectively a strong nudge to encode the following five new IDCs (*Ideographic Description Characters*) that were preliminarily proposed in L2/21-118R (aka [IRG N2492](#)), four of which were originally proposed in L2/17-386 (aka [IRG N2273](#)) and L2/18-012 (aka [IRG N2273R](#)):

IDC	Type	Character Name
	Binary	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM RIGHT
	Binary	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LOWER RIGHT
	Unary	IDEOGRAPHIC DESCRIPTION CHARACTER HORIZONTAL REFLECTION

IDC	Type	Character Name
	Unary	IDEOGRAPHIC DESCRIPTION CHARACTER ONE HUNDRED EIGHTY DEGREE ROTATION
	Binary	IDEOGRAPHIC DESCRIPTION CHARACTER STROKE SUBTRACTION

Ken Lunde, John Jenkins, and Andrew West will prepare and submit a final IDC-only proposal that will first be discussed during the IRG #59 meeting in mid-October, immediately followed by the UTC #173 meeting in early November.

The group is fully aware that the two proposed unary IDCs, IDEOGRAPHIC DESCRIPTION CHARACTER HORIZONTAL REFLECTION and IDEOGRAPHIC DESCRIPTION CHARACTER ONE HUNDRED EIGHTY DEGREE ROTATION, resolve as no-ops if strung together. For example, 正 corresponds to 𠄎, but 正 corresponds to 𠄎, which is a no-op. The group is also fully aware of the inherit ambiguity in the proposed binary IDC, IDEOGRAPHIC DESCRIPTION CHARACTER STROKE SUBTRACTION, about which some experts have concerns for introducing a new dimension of adverse effects on automatic matching algorithms. The way in which IDCs are currently used, which requires a non-zero amount of human interaction for interpretation, strongly suggests that these will not be issues in practical usage.

If one or more of these new IDses pose problems for the IRG, such as when performing IDS matching against IRG submission data, the IRG could simply mandate in its P&P (*Principles & Procedures*) that such IDCs cannot be used in IDses for IRG submissions. IDS database maintainers do not necessarily have such constraints.

Lastly, although it is merely an excerpt from pp 19 and 20 of [L2/08-193](#) (aka [WG2 N3288](#)), the group observed that the following two IDCs that are shown on page 3 of the document incorrectly order the components, specifically that the enclosing component should be the first component and the enclosed component should be the second component: 8 (SURROUND FROM BELOW) and 13 (SURROUND FROM LOWER LEFT). The former IDC is U+2FF6  IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM BELOW, and the latter one is U+2FFA  IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LOWER LEFT.

Recommendations: The group recommends to the UTC the following disposition 

Action Item for Ken Lunde, John Jenkins, Andrew West, CJK: Prepare and submit a final proposal for five new Ideographic Description Characters, based on Section 15 of document L2/22-127.

Action Item for Ken Lunde, CJK: Convey to the author of document L2/22-136 the CJK & Unihan Group comments in Section 15 of document L2/22-127.

16) [L2/22-158](#): CJK Unified Ideographs Extension B UCS2003 Reference Glyphs Archival Code Charts

Comments: The group reviewed this document, which follows up on UTC Action Item [163-A27](#), which was for preparing the archival code charts for the CJK Unified Ideographs Extension B

UCS2003 reference glyphs. The group agreed that the contents of the draft cover page and of the code charts themselves look reasonable, but the group defers to the UTC and the Unicode Editorial Committee in terms of finalizing its content, deciding on a file name if the suggested *U20000-UCS2003.pdf* one is not acceptable, and the hosting details for the Unicode Consortium’s web site.

Recommendations: The group recommends to the UTC the following disposition ⇨

Action Item for Michel Suignard, EDC: Finalize the archival code charts for the CJK Unified Ideographs Extension B UCS2003 reference glyphs, decide where to host it, and decide from what page or pages it should be referenced, based on Section 16 of document L2/22-127.

17) IRG Working Set 2021 (aka Extension I) Status

Ken Lunde completed the review of the UTC-assigned portion of IRG Working Set 2021 Version 3.0—serial numbers 1248 through 2466—on 07/03/2022. The review deadline was 07/08/2022. According to Recommendation IRG M58.7 in [IRG N2530](#) (aka [L2/22-078](#)), the ORT (*Online Review Tool*) Manager will release Consolidated Comments by 2022-07-22, and feedback is due by 2022-09-16.

Recommendations: The group recommends to the UTC the following disposition ⇨

No UTC action is required.

18) Unicode Version 16.0

The CJK & Unihan Group plans to focus on the following items for Unicode Version 16.0:

- Overhaul and expand the existing provisional *kMorohashi* property to cover nearly 50,000 CJK Unified Ideographs. This property maps CJK Unified Ideographs to *Dai Kanwa Jiten* (大漢和辭典) index numbers. The plan also includes removing the provisional *kIRGDaiKanwaZiten* property.
- Add a new provisional *kMojiJoho* property that will cover over 52,000 CJK Unified Ideographs. This property will map CJK Unified Ideographs, along with SVSes (*Standardized Variation Sequences*) and *Moji_Joho* IVSes (*Ideographic Variation Sequences*), to Moji Jōhō Kiban database serial numbers.
- Add a new provisional *kJapanese* property that will cover over 51,000 CJK Unified Ideographs, and which will express Japanese readings using hiragana and katakana.
- Add a new provisional *kSoengmou2003* property, which is likely to have a significant impact on *kRSUnicode* property values, because this source includes a significant number of ideographs that are indexed via multiple radicals. Note that *sSoengmou2003* is included as an additional source in UAX #38 for Unicode Version 15.0, so this proposal would promote it to a new provisional property.
- Encode five new Ideographic Description Characters (IDCs).

- Add approximately 60 new property values to the provisional *kStrange* property, over half of which are in the CJK Unified Ideographs Extension H block.

IRG Working Set 2021 is unlikely to be ready to be included as the new CJK Unified Ideographs Extension I block.

Recommendations: The group recommends to the UTC the following disposition ⇨

No UTC action is required.

That is all.