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Proposals from the Script Encoding Initiative

Title
Proposal for encoding the Palmyrene script in the SMP of the UCS

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Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Organisation Internationale de Normalisation
Международная организация по стандартизации

1. Introduction. The Palmyrene alphabet was used from the first century BCE, in a small independent state established in the Syrian desert between Damascus and the Euphrates. The alphabet was derived as a national script by modification of the customary forms of cursive Aramaic which themselves developed during the first Persian Empire.

Palmyrene is known from documents distributed over a period from the year 9 BCE until 273 CE, the date of the sack of Palmyra by Aurelian. Palmyrene has both a monumental and a cursive form. Fonts for Palmyrene typically follow the monumental style as in the examples below (just as is typical for Latin and Greek). There are only a few fragmentary documents on perishable materials; there are a few painted inscriptions, but many inscriptions on stone. It may be that the monumental forms were derived from the cursive. Earlier inscriptions show more rounded forms, but later inscriptions tended to regularize the letterforms, perhaps in imitation of the monumental the Greek script.

Cursive forms of the script have more ligatures than the monumental forms do, but ligatures are optional, as will be discussed below. At a certain point, some letterforms became confused and in Palmyrene a distinguishing diacritical dot was introduced. This may have been the first appearance of such a feature in the Western Semitic scripts. In the code chart here, RESH is distinguished from DALETH by means of a dot—but there are also styles in which the two letters are distinct in shape and where a dot is not used.

2. Processing. Palmyrene is written from right to left horizontally. Palmyrene language inscriptions usually have no space between words; modern editors tend to insert U+0020 SPACE. Sorting order is as in the code chart. The letter PALMYRENE LETTER FINAL NUN is to be treated in the same way as HEBREW LETTER FINAL NUN is.

3. Ligation is sometimes used in Palmyrene; it is common, but not obligatory. In fonts which implement automatic ligation, ZWNJ can be used to break the ligatures. In fonts which do not implement automatic ligation, ZWJ can be used to force the ligatures. OpenType features like "Discretionary Ligatures" or "Historic Ligatures" may be used. This is a matter for the designer's judgement. The table below is displayed in visual order:

b' 𐡡𐡠 = ALEPH 𐡠 + BETH 𐡡 ←   *ḥd* 𐡇𐡃 = DALETH 𐡃 + HETH 𐡇 ←

bd 𐡡𐡃 = DALETH 𐡃 + BETH 𐡡 ←   *ḥw* 𐡇𐡅 = WAW 𐡅 + HETH 𐡇 ←

bw 𐡡𐡅 = WAW 𐡅 + BETH 𐡡 ←   *ḥr* 𐡇𐡓 = RESH 𐡓 + HETH 𐡇 ←

br 𐡡𐡓 = RESH 𐡓 + BETH 𐡡 ←

bt 𐡡𐡕 = TAW 𐡕 + BETH 𐡡 ←

m' 𐡀𐡌 = ALEPH 𐡀 + MEM 𐡌 ←   n' 𐡀𐡍 = ALEPH 𐡀 + NUN 𐡍 ←

md 𐡃𐡌 = DALETH 𐡃 + MEM 𐡌 ←   nh 𐡄𐡍 = HE 𐡄 + NUN 𐡍 ←

mḥ 𐡇𐡌 = HETH 𐡇 + MEM 𐡌 ←   nw 𐡅𐡍 = WAW 𐡅 + NUN 𐡍 ←

mr 𐡓𐡌 = RESH 𐡓 + MEM 𐡌 ←   nt 𐡕𐡍 = TAW 𐡕 + NUN 𐡍 ←

mt 𐡕𐡌 = TAW 𐡕 + MEM 𐡌 ←   pl 𐡋𐡐 = LAMEDH 𐡋 + PE 𐡐 ←

qd 𐡃𐡒 = DALETH 𐡃 + QOPH 𐡒 ←

qr 𐡓𐡒 = RESH 𐡓 + QOPH 𐡒 ←

The letter NUN has a swash tail which often trails under the following letter. In particular note NUN followed by YODH:

ny 𐡍𐡉 = YODH 𐡉 + NUN 𐡍 ←

4. Character names. The names used for the characters here are based on those used for Imperial Aramaic. Other West Semitic names may have some currency, but the UCS Imperial Aramic names have been preferred here since Palmyrene is an Aramaic language.

5. Numerals. Palmyrene numerals are built up out of 1, 2, 3, 4, 5, 10, and 20. The numbers 2 𐡲 and 3 𐡳 and 4 𐡴 are composed of multiples of 1 𐡱, but because in practice the numbers are clumped together as units separate from one another they are encoded as individual characters. The last stroke is sometimes lengthened. The origin of the highest numbers in their Aramaic predecessors is clear; compare Aramaic numbers 10 ⟋, 20 ⟋ (in origin two 10s one atop the other), and 100 ⟋ (in origin, a 10 with a stroke added to differentiate it from 100) with Palmyrene 10 ⟋, 20 𐡹, 100 ⟋. Note that in Palmyrene the originally distinct 10 and 100 have coalesced into the same character. The numbers have right-to-left directionality. In the chart below, the third and sixth columns are displayed in visual order.

1	𐡱	1 ←	11	𐡱⟋	1 + 10 ←
2	𐡲	2 ←	12	𐡲⟋	2 + 10 ←
3	𐡳	3 ←	13	𐡳⟋	3 + 10 ←
4	𐡴	4 ←	14	𐡴⟋	4 + 10 ←
5	𐡵	5 ←	15	𐡵⟋	5 + 10 ←
6	𐡱𐡵	1 + 5 ←	16	𐡱𐡵⟋	1 + 5 + 10 ←
7	𐡲𐡵	2 + 5 ←	17	𐡲𐡵⟋	2 + 5 + 10 ←
8	𐡳𐡵	3 + 5 ←	18	𐡳𐡵⟋	3 + 5 + 10 ←
9	𐡴𐡵	4 + 5 ←	19	𐡴𐡵⟋	4 + 5 + 10 ←
10	⟋	10 ←	100	⟋𐡱	10 + 1 ←
20	𐡹	20 ←	200	⟋𐡲	10 + 2 ←
30	⟋𐡹	10 + 20 ←	300	⟋𐡳	10 + 3 ←
40	𐡹𐡹	20 + 20 ←	400	⟋𐡴	10 + 4 ←
50	⟋𐡹𐡹	10 + 20 + 20 ←	500	⟋𐡵	10 + 5 ←
60	𐡹𐡹𐡹	20 + 20 + 20 ←	600	⟋𐡱𐡵	10 + 1 + 5 ←
70	⟋𐡹𐡹𐡹	10 + 20 + 20 + 20 ←	700	⟋𐡲𐡵	10 + 2 + 5 ←
80	𐡹𐡹𐡹𐡹	20 + 20 + 20 + 20 ←	800	⟋𐡳𐡵	10 + 3 + 5 ←
90	⟋𐡹𐡹𐡹𐡹	10 + 20 + 20 + 20 + 20 ←	900	⟋𐡴𐡵	10 + 4 + 5 ←

To say 134, 𐡴⟋𐡹⟋𐡱 would be written. Examples of other compound numbers are given in Figures 4, 5, 6, 7, 9, 10, 11, and 12.

6. Punctuation. Two ornamental leaves are found in inscriptions and printed texts and have been encoded at U+10877..10878. They tend to appear near numbers. The texts give no information as their line-breaking properties, but they should not break before or after and a space should be used if necessary.

7. Unicode Character Properties

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10860;PALMYRENE LETTER ALEPH;Lo;0;R;;;;;N;;;;;
10861;PALMYRENE LETTER BETH;Lo;0;R;;;;;N;;;;;
10862;PALMYRENE LETTER GIMEL;Lo;0;R;;;;;N;;;;;
10863;PALMYRENE LETTER DALETH;Lo;0;R;;;;;N;;;;;
10864;PALMYRENE LETTER HE;Lo;0;R;;;;;N;;;;;
10865;PALMYRENE LETTER WAW;Lo;0;R;;;;;N;;;;;
10866;PALMYRENE LETTER ZAYIN;Lo;0;R;;;;;N;;;;;
10867;PALMYRENE LETTER HETH;Lo;0;R;;;;;N;;;;;
10868;PALMYRENE LETTER TETH;Lo;0;R;;;;;N;;;;;
10869;PALMYRENE LETTER YODH;Lo;0;R;;;;;N;;;;;
1086A;PALMYRENE LETTER KAPH;Lo;0;R;;;;;N;;;;;
1086B;PALMYRENE LETTER LAMEDH;Lo;0;R;;;;;N;;;;;
1086C;PALMYRENE LETTER MEM;Lo;0;R;;;;;N;;;;;
1086D;PALMYRENE LETTER FINAL NUN;Lo;0;R;;;;;N;;;;;
1086E;PALMYRENE LETTER NUN;Lo;0;R;;;;;N;;;;;
1086F;PALMYRENE LETTER SAMEKH;Lo;0;R;;;;;N;;;;;
10870;PALMYRENE LETTER AYIN;Lo;0;R;;;;;N;;;;;
10871;PALMYRENE LETTER PE;Lo;0;R;;;;;N;;;;;
10872;PALMYRENE LETTER SADHE;Lo;0;R;;;;;N;;;;;
10873;PALMYRENE LETTER QOPH;Lo;0;R;;;;;N;;;;;
10874;PALMYRENE LETTER RESH;Lo;0;R;;;;;N;;;;;
10875;PALMYRENE LETTER SHIN;Lo;0;R;;;;;N;;;;;
10876;PALMYRENE LETTER TAW;Lo;0;R;;;;;N;;;;;
10877;PALMYRENE LEFT-POINTING FLEURON;So;0;ON;;;;;N;;;;;
10878;PALMYRENE RIGHT-POINTING FLEURON;So;0;ON;;;;;N;;;;;
10879;PALMYRENE NUMBER ONE;No;0;R;;;;1;N;;;;;
1087A;PALMYRENE NUMBER TWO;No;0;R;;;;2;N;;;;;
1087B;PALMYRENE NUMBER THREE;No;0;R;;;;3;N;;;;;
1087C;PALMYRENE NUMBER FOUR;No;0;R;;;;4;N;;;;;
1087D;PALMYRENE NUMBER FIVE;No;0;R;;;;5;N;;;;;
1087E;PALMYRENE NUMBER TEN;No;0;R;;;;10;N;;;;;
1087F;PALMYRENE NUMBER TWENTY;No;0;R;;;;20;N;;;;;
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
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	1086	1087
0	ᡠ 10860	ᡰ 10870
1	ᡡ 10861	ᡱ 10871
2	ᡢ 10862	ᡲ 10872
3	ᡣ 10863	ᡳ 10873
4	ᡤ 10864	ᡴ 10874
5	ᡥ 10865	ᡵ 10875
6	ᡦ 10866	ᡶ 10876
7	ᡧ 10867	ᡷ 10877
8	ᡨ 10868	ᡸ 10878
9	ᡩ 10869	᠎ 10879
A	ᡪ 1086A	᠎ 1087A
B	ᡫ 1086B	᠎ 1087B
C	ᡬ 1086C	᠎ 1087C
D	ᡭ 1086D	᠎ 1087D
E	ᡮ 1086E	᠎ 1087E
F	ᡯ 1086F	᠎ 1087F

Letters

10860	ᡠ	PALMYRENE LETTER ALEPH
10861		PALMYRENE LETTER BETH
10862		PALMYRENE LETTER GIMEL
10863		PALMYRENE LETTER DALETH
10864		PALMYRENE LETTER HE
10865		PALMYRENE LETTER WAW
10866		PALMYRENE LETTER ZAYIN
10867		PALMYRENE LETTER HETH
10868		PALMYRENE LETTER TETH
10869		PALMYRENE LETTER YODH
1086A		PALMYRENE LETTER KAPH
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1086D		PALMYRENE LETTER FINAL NUN
1086E		PALMYRENE LETTER NUN
1086F		PALMYRENE LETTER SAMEKH
10870		PALMYRENE LETTER AYIN
10871		PALMYRENE LETTER PE
10872		PALMYRENE LETTER SADHE
10873		PALMYRENE LETTER QOPH
10874		PALMYRENE LETTER RESH
10875		PALMYRENE LETTER SHIN
10876		PALMYRENE LETTER TAW

Symbols

10877		PALMYRENE LEFT-POINTING FLEURON
10878		PALMYRENE RIGHT-POINTING FLEURON

Numbers

10879		PALMYRENE NUMBER ONE
1087A		PALMYRENE NUMBER TWO
1087B		PALMYRENE NUMBER THREE
1087C		PALMYRENE NUMBER FOUR
1087D		PALMYRENE NUMBER FIVE
1087E		PALMYRENE NUMBER TEN
		• also used for hundreds
1087F		PALMYRENE NUMBER TWENTY

10. Figures.

Figure 1. Chart of Semitic alphabets from Ballhorn 1864, showing Palmyrene.

SCHRIFTEN IM OSTEN PALÄSTINA'S.

Hauranitisch		Nabathäisch	Palmyrenisch	Wert
nach HALÉVY	H. MÜLLER			
ΥΥΚ𐤋𐤋𐤁𐤔𐤂𐤔𐤔	⸿	ᒐ ᒐ ⊙ 𐤋 𐤋	𐡀 𐡀 𐡀	a
)𐤂((𐤂)	𐅃	ᒍ ᒍ ∫ ∫	𐡁𐡁	b
𐤕⊥𐤕⊥𐤕⊥𐤋𐤄	⅂	⋋ ᒍ ⅏ 𐤕⋋	𐡂	g
𐤀𐤔𐤀𐤔𐤕𐤔𐤔	4	'𐤄 𐤍 𐤍 𐤄	𐡃	d
Υ𐤋𐤀𐤔𐤃𐤃𐤃←	H	𐅏 ⅁ 𐤃 𐤄 𐤔 𐤋 𐤔 ⅁	𐡄	h
𐤔𐤗𐤋𐤋𐤄𐤔𐤄		𐤄 𐤔 𐤄 𐤄	𐡅𐡅	w
H ⊞ 𐤀	Ⓞ	∣	I	z
∀𐤋𐤔∃∈∃<∈ΙΝ𐤋ΙΙΙ 𐤗𐤊	⅄	𐤔𐤔 𐤗𐤗 𐤚𐤚 𐤄𐤄	𐡇	χ
HH 𐤍 𐤀	𐤜𐤖	𐤈𐤁 𐤁 𐤁 𐤔 𐤔	𐡈	ṭ
𐤏𐤋𐤔𐤔𐤏𐤔𐤋	𐤏𐤋	᠔ᠤ ᠔ᠤ ᠔ᠤ ᠔ᠤ	𐡉 𐡉	y
ᛁᛏᛁᛐᛁ𐤄	𐤊⅃	𐤒 𐤔 𐤔 𐤋 𐤕	𐡊 𐡊	k
∣ 𐤋 ∣	∫∫	⟋ ᠔ ᠔ 𐤋 ᠔	𐡋	l
𐤃𐡌𐤂V𐤋⏥𐤅⏚𐤍𐤅	⊳	𐤅 𐤅 𐤃 𐤔 𐤍 𐤅 𐤅 ×	𐡌	m
∣	𐤋	𐤔 ∫ ∣	𐡍 𐡍	n
∧V∩𐤅∩𐤅	𐤁 𐤅	𐤄 𐤄	𐡎𐡎	s
○𐤉𐤅𐤔𐤄	○	𐤗 𐤗 𐤃 𐤋 𐤀	𐡏𐡏	a
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Figure 2. Chart of "scripts in the east of Palestine" from Faulmann 1880, showing Palmyrene.

ALPHABETS ARAMÉENS COMPARÉS.

(ARAMÉEN ANCIEN, PALMYRÉNIEN, NABATÉEN.)

Figure 3. Chart of "Aramaic alphabets" from Fossey 1948, showing Palmyrene.

Figure 4. Sample text in Palmyrene from Fossey 1948. The number 554 is shown.

Figure 5. Sample of Palmyrene text from Christian 1905.
Note the NUMBER ONE HUNDRED and the LEFT-POINTING FLEURON. The numbers 563 and 541 are shown.

Figure 6. Sample text in Palmyrene from the Imprimerie Nationale 1990. Note the PALMYRENE LEFT-POINTING FLEURON. The number 563 is shown.

Figure 7. Sample inscription in Palmyrene.
In the second line reading from the right, the number 368 is shown.

Figure 8. Sample inscription in Palmyrene.

Figure 9. Sample texts in Palmyrene from Lidzbarski 1898. Note the LEFT-POINTING FLEURON. The number 52x is shown in the text on the left, and 437 in the text on the right.

Figure 10. Sample text in Palmyrene from Lidzbarski 1898. Note the LEFT- and RIGHT-POINTING FLEURONS. The number 569 is shown in the text on the left, and 566 in the text on the right.

Figure 11. Sample text in Palmyrene from Lidzbarski 1898. Note the LEFT- and RIGHT-POINTING FLEURONS. The number 563 is shown in the text on the left.

Figure 12. Sample text in Palmyrene from Lidzbarski 1898. Note the LEFT- and RIGHT-POINTING FLEURONS. The number 425 is shown in the text on the right.

A. Administrative

1. Title
Preliminary proposal for encoding the Palmyrene script in the SMP of the UCS
2. Requester's name
UC Berkeley Script Encoding Initiative (Universal Scripts Project)
3. Requester type (Member body/Liaison/Individual contribution)
Liaison contribution.
4. Submission date
2010-07-29
5. Requester's reference (if applicable)
6. Choose one of the following:
6a. This is a complete proposal
No.
6b. More information will be provided later
Yes.

B. Technical – General

1. Choose one of the following:
1a. This proposal is for a new script (set of characters)
Yes.
1b. Proposed name of script
Palmyrene.
1c. The proposal is for addition of character(s) to an existing block
No.
1d. Name of the existing block
2. Number of characters in proposal
32.
3. Proposed category (A-Contemporary; B.1-Specialized (small collection); B.2-Specialized (large collection); C-Major extinct; D-Attested extinct; E-Minor extinct; F-Archaic Hieroglyphic or Ideographic; G-Obscure or questionable usage symbols)
Category E.
4a. Is a repertoire including character names provided?
Yes.
4b. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?
Yes.
4c. Are the character shapes attached in a legible form suitable for review?
Yes.
5a. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?
Michael Everson.
5b. If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used:
Michael Everson, FontLab.
6a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?
Yes.
6b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?
Yes.
7. Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?
Yes.
8. Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database http://www.unicode.org/Public/UNIDATA/ UnicodeCharacterDatabase.html and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.
See above.

C. Technical – Justification

1. Has this proposal for addition of character(s) been submitted before? If YES, explain.
No.
2a. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)?
Yes.
2b. If YES, with whom?
Reinhard Lehmann, John Healey, and Viktor Golinets.
2c. If YES, available relevant documents
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?
See above.

4a. The context of use for the proposed characters (type of use; common or rare)

To write the Aramaic language.

4b. Reference

5a. Are the proposed characters in current use by the user community?

Yes.

5b. If YES, where?

In scholarly publications.

6a. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?

No.

6b. If YES, is a rationale provided?

6c. If YES, reference

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?

Yes.

8a. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?

No.

8b. If YES, is a rationale for its inclusion provided?

8c. If YES, reference

9a. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?

No.

9b. If YES, is a rationale for its inclusion provided?

9c. If YES, reference

10a. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?

No.

10b. If YES, is a rationale for its inclusion provided?

10c. If YES, reference

11a. Does the proposal include use of combining characters and/or use of composite sequences (see clauses 4.12 and 4.14 in ISO/IEC 10646-1: 2000)?

No.

11b. If YES, is a rationale for such use provided?

11c. If YES, reference

11d. Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?

No.

11e. If YES, reference

12a. Does the proposal contain characters with any special properties such as control function or similar semantics?

No.

12b. If YES, describe in detail (include attachment if necessary)

13a. Does the proposal contain any Ideographic compatibility character(s)?

No.

13b. If YES, is the equivalent corresponding unified ideographic character(s) identified?