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

Doc Type: Working Group Document

Title: Proposal for encoding the Palmyrene script in the SMP of the UCS Source: UC Berkeley Script Encoding Initiative (Universal Scripts Project)

Source: Michael Everson

Status: Individual Contribution

Action: For consideration by JTC1/SC2/WG2 and UTC

Date: 2010-07-15

1. Introduction. The Palmyrene alphabet was used from the first century BCE, in a small independent state established near the Red Sea, north of 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). No documents on perishable materials have survived; there are a few painted inscriptions, but many inscriptions on stone. It appears 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.
- **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:

$$b'$$
 $\lambda = ALEPH \lambda + BETH \Delta \leftarrow$
 $bd = DALETH + BETH \Delta \leftarrow$
 $bw = DALETH + BETH \Delta \leftarrow$
 $bw = ALEPH \lambda + BETH \Delta$
 $bw = A$

$$m'$$
 $\&$ $\&$ $=$ ALEPH $\&$ $+$ MEM $\&$ $=$ md \bigvee $=$ DALETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ HETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ HETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ HETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ HETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ HETH \bigvee $+$ MEM \bigvee \leftarrow md \bigvee $=$ TAW \bigvee $+$ NUN \bigvee \leftarrow md \bigvee $=$ TAW \bigvee $+$ NUN \bigvee \leftarrow md \bigvee $=$ TAW \bigvee $+$ MEM \bigvee $+$ MEM

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

$$ny \mathcal{J} = YODH \mathcal{I} + NUN \mathcal{I} \leftarrow$$

- **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, 20, and 100. The numbers 2) and 3) and 4) are composed of multiples of 1), but because in practice the numbers are clumped together as units separate from one another they are encoded as individual characters. 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 , 100 . In the inscriptions Palmyrene number 100 tends to look quite like 10, but they are encoded distinctly here, and the glyph of the 100 given a slight upturn which occasionally occurs in the inscriptions. The numbers have right-to-left directionality. In the chart below, the third and sixth columns are displayed in visual order.

1)	1 ←	11) 	1 + 10 ←
2	<i>))</i>	2 ←	12)) 	2 + 10 ←
3	<i>)))</i>	3 ←	13))) 	3 + 10 ←
4))))	4 ←	14))" ~~	4 + 10 ←
5	y	5 ←	15	У -	5 + 10 ←
6	<i>)</i> ሃ	1 + 5 ←	16	リケーコ	$1 + 5 + 10 \leftarrow$
7	リソ	2 + 5 ←	17	ルグーマ	$2 + 5 + 10 \leftarrow$
8	אוון	3 + 5 ←	18	<i>ッ</i> ツーマ	$3 + 5 + 10 \leftarrow$
9	<i>אייון</i>	4 + 5 ←	19	רייון	$4 + 5 + 10 \leftarrow$
				_	
10		10 ←	100	رح	100 + 1 ←
10 20	3	10 ← 20 ←	100 200	رز حب	100 + 1 ← 100 + 2 ←
	 3			رار حب سي إلا	
20	33	20 ←	200		100 + 2 ←
20 30	33 33 33	20 ← 10 + 20 ←	200 300		$100 + 2 \leftarrow 100 + 3 \leftarrow$
20 30 40	$\frac{33}{333}$ 33	$20 \leftarrow$ $10 + 20 \leftarrow$ $20 + 20 \leftarrow$	200 300 400	الاً الله الله الله الله الله الله الله	$100 + 2 \leftarrow 100 + 3 \leftarrow 100 + 4 \leftarrow$
20 30 40 50	33 333 333 333 333	$20 \leftarrow$ $10 + 20 \leftarrow$ $20 + 20 \leftarrow$ $10 + 20 + 20 \leftarrow$	200 300 400 500		$100 + 2 \leftarrow 100 + 3 \leftarrow 100 + 4 \leftarrow 100 + 5 \leftarrow 100 + 100 $
20 30 40 50 60	$\frac{33}{333}$ 33	$20 \leftarrow$ $10 + 20 \leftarrow$ $20 + 20 \leftarrow$ $10 + 20 + 20 \leftarrow$ $20 + 20 + 20 \leftarrow$	200 300 400 500 600	الاً الله الله الله الله الله الله الله	$100 + 2 \leftarrow$ $100 + 3 \leftarrow$ $100 + 4 \leftarrow$ $100 + 5 \leftarrow$ $100 + 1 + 5 \leftarrow$

To say 134, $\mathfrak{M} \rightarrow 3 \rightarrow 1$ would be written. Examples of other compound numbers are given in Figures 4, 5, 6, 7, 9, 10, 11, and 12.

6. Punctuation. Script-specific punctuation for Palmyrene is not known. Two ornamental leaves are found in inscriptions and printed texts and have been encoded at U+10876..10877. They tend to appear near numbers. The texts give no information as to what their line-breaking properties should be.

7. Unicode Character Properties

```
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 NUN; Lo; 0; R;;;;; N;;;;;
1086E; PALMYRENE LETTER SAMEKH; Lo; 0; R;;;;; N;;;;;
1086F; PALMYRENE LETTER AYIN; Lo; 0; R;;;;; N;;;;;
10870; PALMYRENE LETTER PE; Lo; 0; R;;;;; N;;;;;
10871; PALMYRENE LETTER SADHE; Lo; 0; R;;;;; N;;;;
10872; PALMYRENE LETTER QOPH; Lo; 0; R;;;;; N;;;;
10873; PALMYRENE LETTER RESH; Lo; 0; R;;;;; N;;;;;
10874; PALMYRENE LETTER SHIN; Lo; 0; R;;;;; N;;;;;
10875; PALMYRENE LETTER TAW; Lo; 0; R;;;;; N;;;;;
10876; PALMYRENE LEFT-POINTING FLEURON; So; 0; ON;;;;; N;;;;
10877; PALMYRENE RIGHT-POINTING FLEURON; So; 0; ON; ;; ;; N; ;; ;;
10878; PALMYRENE NUMBER ONE; No; 0; R;;;; 1; N;;;;;
10879; PALMYRENE NUMBER TWO; No; 0; R;;;; 2; N;;;;;
1087A; PALMYRENE NUMBER THREE; No; 0; R;;;; 3; N;;;;;
1087B; PALMYRENE NUMBER FOUR; No; 0; R;;;; 4; N;;;;;
1087C; PALMYRENE NUMBER FIVE; No; 0; R;;;; 5; N;;;;;
1087D; PALMYRENE NUMBER TEN; No; 0; R;;;; 10; N;;;;
1087E; PALMYRENE NUMBER TWENTY; No; 0; R;;;; 20; N;;;;;
1087F; PALMYRENE NUMBER ONE HUNDRED; No; 0; R;;;; 100; N;;;;;
```

8. Bibliography

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9. Acknowledgements. This project was made possible in part by a grant from the U.S. National Endowment for the Humanities, which funded the Universal Scripts Project (part of the Script Encoding Initiative at UC Berkeley) in respect of the Palmyrene encoding. Any views, findings, conclusions or recommendations expressed in this publication do not necessarily reflect those of the National Endowment of the Humanities.

	1086	1087
0	10860	3
1	10861	K
2	10862	10872
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4	10863	10873
5	10864	J 10874
6	10865	431
7	10866 K	10876
8	10867	10877
9	10868))
Α	<u>10869</u>)))
В	1086A))))
С	1086B	1087B
D	1086C	1087C
E	1086D	1087D
F	1086E	1087E
	1086F	1087F

Letters

10860 & PALMYRENE LETTER ALEPH 10861 PALMYRENE LETTER BETH 10862 **\(\)** PALMYRENE LETTER GIMEL **Y** PALMYRENE LETTER DALETH 10863 10864 PALMYRENE LETTER HE 10865 PALMYRENE LETTER WAW 10866 PALMYRENE LETTER ZAYIN 10867 PALMYRENE LETTER HETH 10868 PALMYRENE LETTER TETH 10869 PALMYRENE LETTER YODH PALMYRENE LETTER KAPH
PALMYRENE LETTER LAME 1086A 1086B PALMYRENE LETTER LAMEDH 1086C PALMYRENE LETTER MEM 1086D PALMYRENE LETTER NUN 1086E PALMYRENE LETTER SAMEKH 1086F PALMYRENE LETTER AYIN 10870 PALMYRENE LETTER PE 10871 **J** PALMYRENE LETTER SADHE PALMYRENE LETTER QOPH
PALMYRENE LETTER RESH 10872 10873 PALMYRENE LETTER RESH **と** PALMYRENE LETTER SHIN 10874 10875 > PALMYRENE LETTER TAW

Symbols

10876 SP PALMYRENE LEFT-POINTING FLEURON 10877 PALMYRENE RIGHT-POINTING FLEURON

Numbers

Date: 2010-07-15

```
10878 J PALMYRENE NUMBER ONE
10879 JJ PALMYRENE NUMBER TWO
1087A JJ PALMYRENE NUMBER THREE
1087B JJ PALMYRENE NUMBER FOUR
1087C J PALMYRENE NUMBER FIVE
1087D PALMYRENE NUMBER TEN
1087E 3 PALMYRENE NUMBER TWENTY
1087F PALMYRENE NUMBER ONE HUNDRED
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10. Figures.

Aelteste Schriftzeichen.						
Aramäisch.	Estrangelo.	Palmyrenisch.	Kufisch.	Altgriechisch.	Altitalisch.	Etrurisch.
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Figure 1. Chart of Semitic alphabets from Ballhorn 1864, showing Palmyrene.

SCHRIFTEN	IM OSTEN	PALÄSTINA'S.
SCHOLLTEN		LALASTINAS.

Hauranitisch		Nabathäisch	Palmyrenisch	Wert
nach Halévy	H. Müller	Napathaisch	rannyremsch	wer
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Y	Ħ	Пэдэ1х1Э	К	h
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In der Wüste Hauran, welche sich zwischen Palästina und Arabien erstreckt, befinden sich Ruinen mit merkwürdigen Inschriften, welche ein Mittelglied zwischen himyarischen und aramäischen Formen bilden. An sie schliessen sich die palmyrenische und die Schrift der Nabathäer, deren Hauptstadt Petra war; die hier gegebenen Zeichen sind theils den Münzen aus dem 2. Jahrhundert v. Chr., theils den sinaitischen Inschriften entnommen, deren Entzifferung besonders den Studien Levy's zu verdanken ist.

Figure 2. Chart of "scripts in the east of Palestine" from Faulmann 1880, showing Palmyrene.

ALPHABETS ARAMÉENS COMPARÉS.

(ARAMÉEN ANCIEN, PALMYRÉNIEN, NABATÉEN.)

	ARAMÉEN ANCIEN.			PALMYRÉNIEN.	NABATÉEN.
VALEUR.	viii° siècle.	vi° siècle.	ive siècle.	PALMITICALIS.	
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Figure 3. Chart of "Aramaic alphabets" from Ballhorn 1864, showing Palmyrene.

TEXTE PALMYRÉNIEN. DÉDICACE DE L'AN 242-243 DE NOTRE ÈRE. DOUZE ANS APRÈS LA VENUE D'ALEXANDRE SÉVÈRE À PALMYRE. グつりはつひ 1224よろとら mls wklm rbaldbz sylrwa sylwy rbwklm mwšnde Julius Statue Nassoum, de Malikou fils, de Malikou fils Aurelius , Zabdila אר גרא אכאף אל לעלניא בעיתייתא אי אלא אלפכנאף כ awhatywtymb aynlkl gtrtsa swrdnskla ahla était qui du lors de la venue , de la colonie stratège dieu Alexandre \mathcal{UCP} とひとへ ひどといいて ドゥスといい KFBሳኔኦ rsk šmšw ydkswnypsrk awhanwmgyh ydkw .César lorsque Et il a servi fut ici et quand, le gouverneur Crispinus לצא רת לגרניא っとな ያ አንአን ነጻን ነን といり 24 aynygl yta naygs nwbz awhw il conduisit Ce que .du marché chef et il était ,long un temps ,les légions ici BUCK OK Press 22242 とっとびゃん 1111ーラ33ーラグ hlalwbswmdw hrkyl4+10+20+20+(100×5) l'an en son honneur et le peuple le sénat à lui ont élevé

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

.554

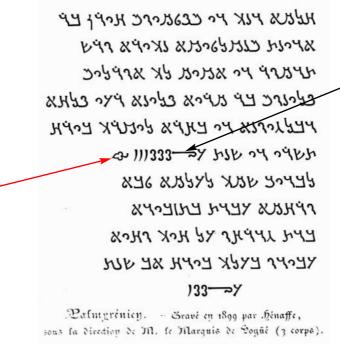


Figure 5. Sample of Palmyrene text from Christian 1905. Note the NUMBER ONE HUNDRED and the LEFT-POINTING FLEURON. The numbers 563 and 541 are shown.

Figure 6. Sample text in Palmyrene from Fossey 1948. Note the PALMYRENE LEFT-POINTING FLEURON, and in the distinct glyphs for tens and hundreds. The numbers 554 and 563 are 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.

תלמט זוג זי ידלים איזלים
שלמלת בי מלא עבריד שיית א
די ארימת לא נילא ידמר לינהיג
די אמר שיית א מיך מך בימא
שנת לה בנר א מיך מר בימא
שנת לה בנר א מין מר בימא

アクス アクログ かってるいないから にくしょく ススストゥ はっしゃ そのかい かんしん しょう かいこう かいこう かいこう かいこう かいっか かいっかい かいっかい かいっかい かいっかい かいっかい かいっかい しょく スート・シャン しょう スート・シャントー こいい しょう しょう しょく アントー アントー アントー アントー

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.

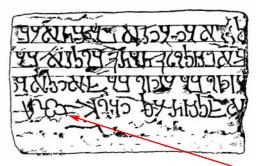


Figure 11. Sample text in Palmyrene from Lidzbarski 1898. Note the LEFT- and RIGHT-POINTING FLEURONS. The number 563 is shown in the text on the left.

ל פעלשמן מדאעלמאעני פבע לבעל ארוך לעל ארוך מדעל לעל ארוך בעל ארוך לבעל ארוך ארוך מדעל ארוך ארוך בעל בעל ארוך ב

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

Requester's name

UC Berkeley Script Encoding Initiative (Universal Scripts Project)

3. Requester type (Member body/Liaison/Individual contribution)

Liaison contribution.

4. Submission date

2010-07-15

- 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?

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?