ISO/IEC JTC1/SC2/WG2 N3284
L2/07-206
2007-07-25

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 to add two numbers for the Phoenician script to the UCS**
Source: **Michael Everson**
Status: **Individual Contribution**
Action: **For consideration by JTC1/SC2/WG2 and UTC**
Date: **2007-07-25**

1. Background. Tha analysis of Phoenician numerals made in N2746R (L2/04-141R2, 2004-05-29) made the assumption that numbers below 10 could all be composed of multiple instances of U+10916 PHOENICIAN NUMBER ONE. More recent research into Imperial Aramaic (N3273R2, L2/07-197R2, 2007-07-25) and its descendants Inscriptional Parthian, Inscriptional Pahlavi, and Psalter Pahlavi (N3286, L2/07-207, 2007-07-25) has shown that the system of numerical notation was slightly more complex, building up the lower numbers with groups of 1, 2, or 3 strokes. This proposal presents a revised discussion of Phoenician numbers and requests the addition of two characters.

2. **Numbers.** Phoenician builds up numbers out of 1, 2, 3, 10, 20, and 100. The numbers 2 𐤖 and 3 𐤗 are composed of multiples of 1 𐤁, but because in practice the numbers are clumped together as units separate from one another they are encoded as individual characters. Numbers above 4 are formed by combining 1, 2, and 3. The origin of the highest numbers has been analysed. Number 20 𐤘 is in origin two 10s 𐤉 one atop the other. The numbers have right-to-left directionality. In the chart below, the third column is displayed in visual order.

1	𐤁	1 ←	11	𐤁𐤉	1 + 10 ←
2	𐤖	2 ←	12	𐤖𐤉	2 + 10 ←
3	𐤗	3 ←	13	𐤗𐤉	3 + 10 ←
4	𐤁 𐤗	1 + 3 ←	14	𐤁 𐤗𐤉	1 + 3 + 10 ←
5	𐤖 𐤗	2 + 3 ←	15	𐤖 𐤗𐤉	2 + 3 + 10 ←
6	𐤗 𐤗	3 + 3 ←	16	𐤗 𐤗𐤉	3 + 3 + 10 ←
7	𐤁 𐤗 𐤗	1 + 3 + 3 ←	17	𐤁 𐤗 𐤗𐤉	1 + 3 + 3 + 10 ←
8	𐤖 𐤗 𐤗	2 + 3 + 3 ←	18	𐤖 𐤗 𐤗𐤉	2 + 3 + 3 + 10 ←
9	𐤗 𐤗 𐤗	3 + 3 + 3 ←	19	𐤗 𐤗 𐤗𐤉	3 + 3 + 3 + 10 ←
10	𐤉	10 ←	100	𐤀𐤁	100 + 1 ←
20	𐤘	20 ←	200	𐤀𐤖	100 + 2 ←
30	𐤉𐤘	10 + 20 ←	300	𐤀𐤗	100 + 3 ←
40	𐤘𐤘	20 + 20 ←	400	𐤀𐤁 𐤗	100 + 1 + 3 ←
50	𐤉𐤘	10 + 20 + 20 ←	500	𐤀𐤖 𐤗	100 + 2 + 3 ←
60	𐤘𐤘𐤘	20 + 20 + 20 ←	600	𐤀𐤗 𐤗	100 + 3 + 3 ←
70	𐤉𐤘𐤘𐤘	10 + 20 + 20 + 20 ←	700	𐤀𐤁 𐤗 𐤗	100 + 1 + 3 + 3 ←
80	𐤘𐤘𐤘𐤘	20 + 20 + 20 + 20 ←	800	𐤀𐤖 𐤗 𐤗	100 + 2 + 3 + 3 ←
90	𐤉𐤘𐤘𐤘𐤘	10 + 20 + 20 + 20 + 20 ←	900	𐤀𐤗 𐤗 𐤗	100 + 3 + 3 + 3 ←
143	𐤗𐤘𐤘𐤀	3 + 20 + 20 + 100 ←	340	𐤘𐤘𐤀𐤗	20 + 20 + 100 + 3 ←

3. Bibliography

Faulmann, Carl. 1990 (1880). *Das Buch der Schrift*. Frankfurt am Main: Eichborn. ISBN 3-8218-1720-8

Ifrah, Georges. 2000. *The universal history of numbers. Volume 1:¨The world's first number-systems. Volume 2: The modern number-system*. Translated from the French by David Bellos, E. F. Harding. Sophie Wood, and Ian Monk. London: Harvill Press. ISBN 1-86046-790-3, ISBN 1-86046-791-1

Imprimerie Nationale. 1990. *Les caractères de l'Imprimerie Nationale*. Paris: Imprimerie Nationale Éditions. ISBN 2-11-081085-8

van den Branden, Albartus. 1969. *Grammaire phénicienne* (Bibliothèque de l'Université Saint-Esprit Kaslik-Liban; 2), Beyrouth: Librairie du Liban.

Unicode Character Properties

```
1091A;PHOENICIAN NUMBER TWO;No;0;R;;;;2;N;;;;;
1091B;PHOENICIAN NUMBER THREE;No;0;R;;;;3;N;;;;;
```

Figures

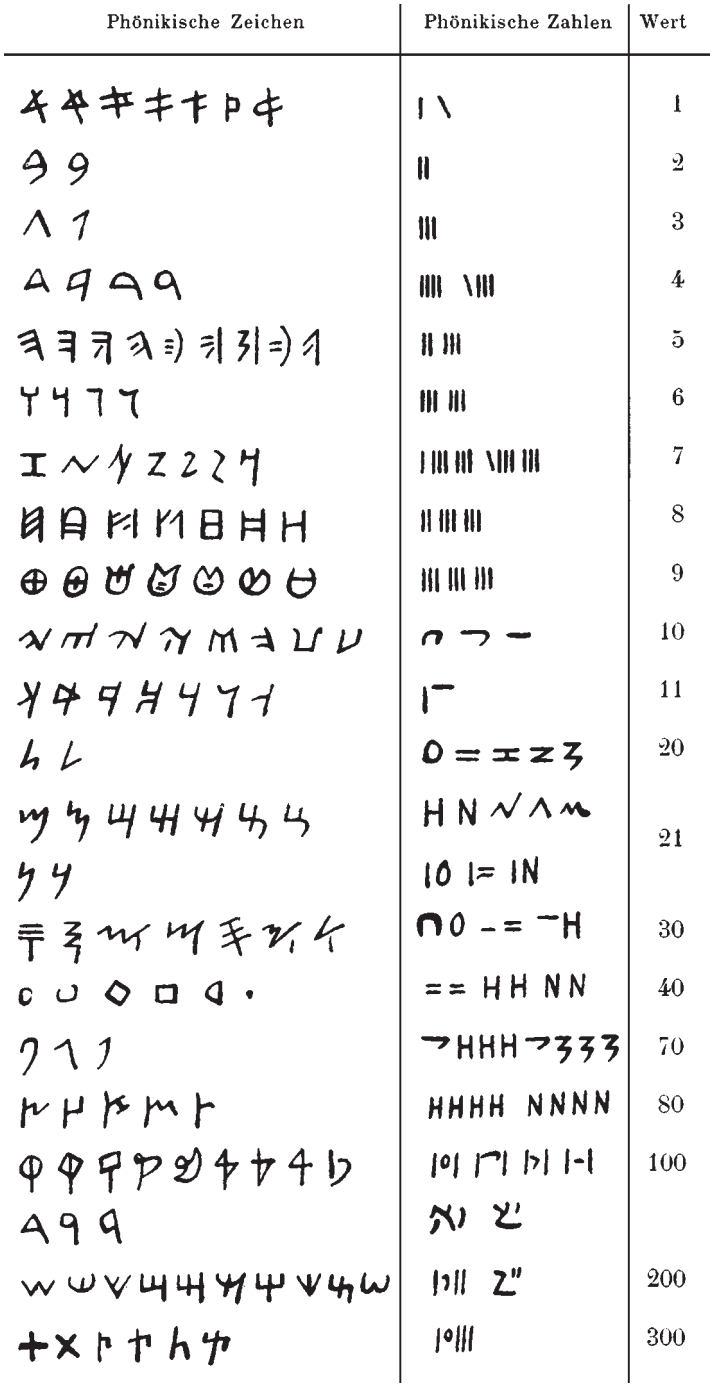
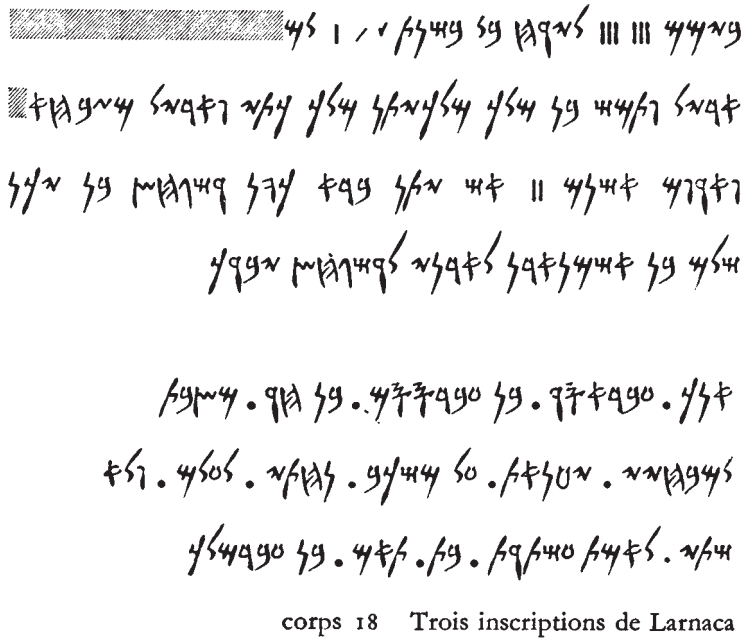


Figure 1. Sample from Faulmann 1880 showing glyph variants for Phoenician letters and numbers.



corps 18 Trois inscriptions de Larnaca

Figure 2. Sample from Imprimerie Nationale 1990:161.

5 – *Les sigles*

133 – Le phénicien connaît aussi un système de signes conventionnels pour désigner les nombres. Leur emploi n'est pas constant.

a – Les unités sont exprimées par un trait vertical qu'on trace en groupe de trois à l'intérieur de la dizaine. Ainsi :

1 = | ; 2 = || ; 3 = ||| ; 4 = |||| ; 6 = ||| ||| etc.

b – Le nombre de 10 est rendu par le signe → ou —, auquel on ajoute le sigle d'unité pour exprimer les nombres 11 à 19. Ainsi:

11 = |→ ,|— ; 13 = |||→ etc.

c – Le nombre 20 est exprimé par un des signes suivants: ; ; ; . Les unités s'ajoutent pour rendre les nombres 21 à 29. Ainsi :

21 = ; 22 = ; 24 = etc.

d – Les sigles pour 10 et 20 servent à former les nombres 30 à 90. Ainsi :

30 = ; 31 = ; 40 = ; 50 = ; 60 = etc.

e – Le nombre 100 est indiqué par un des signes suivants : . Pour former les nombres 101 à 199 se sert des sigles pour 10,20 et les unités. Ainsi:

143 = , etc. Par contre, les centaines sont indiquées par le signe pour cent précédé du signe de l'unité. Ainsi 340 = , c-à-d 3x100 +20 +20.

f – Rarement l'ordre des sigles est renversé. Voir p.ex. 140 exprimé par dans CIS.87,ph).

Figure 3. Table of Phoenician numbers from van den Branden 1969.

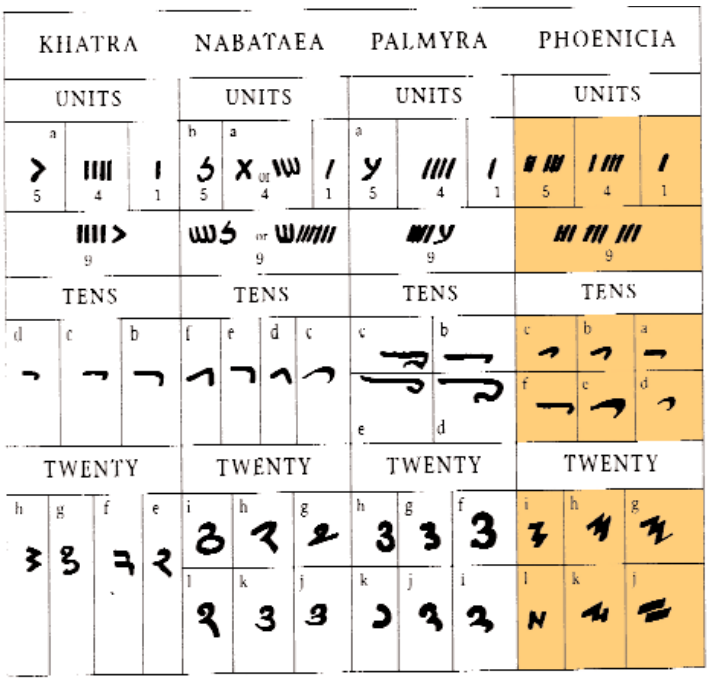


Figure 4. Sample from Ifrah 1998 showing the Phoenician numbers ONE. TWO, THREE, TEN, and TWENTY. The examples here and in Figure 5 are from a variety of sources in the *Corpus Insciptionum Semiticarum*.

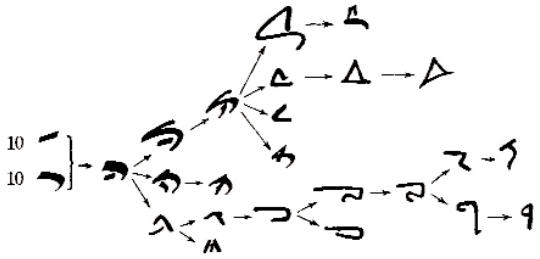


FIG. 18.6. *Origin and development of the figure 100. All these signs derive from placing two variants of the sign for 10 one above the other. This multiplicative combination has a kind of additional superscript to avoid confusing it with the sign for 20, and produced widely different graphical representations of the number 100.*

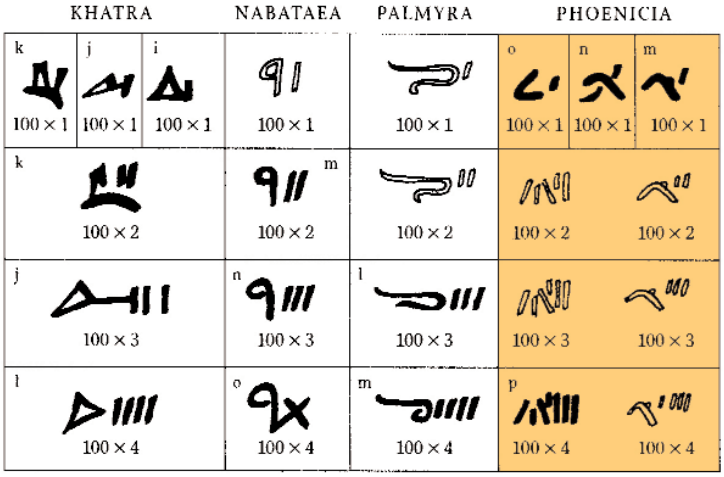


FIG. 18.7. *Semitic representations of the number 100. Attested examples are given in solid lines; reconstructed examples in outline. For sources, see list of references in Fig. 18.2 and 18.5.*

Figure 5. Sample from Ifrah 1998 showing the Phoenician number ONE HUNDRED.

Row 109: PHOENICIAN

	1090	1091
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

hex	Name
00	PHOENICIAN LETTER ALF
01	PHOENICIAN LETTER BET
02	PHOENICIAN LETTER GAML
03	PHOENICIAN LETTER DELT
04	PHOENICIAN LETTER HE
05	PHOENICIAN LETTER WAU
06	PHOENICIAN LETTER ZAI
07	PHOENICIAN LETTER HET
08	PHOENICIAN LETTER TET
09	PHOENICIAN LETTER YOD
0A	PHOENICIAN LETTER KAF
0B	PHOENICIAN LETTER LAMD
0C	PHOENICIAN LETTER MEM
0D	PHOENICIAN LETTER NUN
0E	PHOENICIAN LETTER SEMK
0F	PHOENICIAN LETTER AIN
10	PHOENICIAN LETTER PE
11	PHOENICIAN LETTER SADE
12	PHOENICIAN LETTER QOF
13	PHOENICIAN LETTER ROSH
14	PHOENICIAN LETTER SHIN
15	PHOENICIAN LETTER TAU
16	PHOENICIAN NUMBER ONE
17	PHOENICIAN NUMBER TEN
18	PHOENICIAN NUMBER TWENTY
19	PHOENICIAN NUMBER ONE HUNDRED
1A	PHOENICIAN NUMBER TWO
1B	PHOENICIAN NUMBER THREE
1C	(This position shall not be used)
1D	(This position shall not be used)
1E	(This position shall not be used)
1F	PHOENICIAN WORD SEPARATOR

A. Administrative

1. Title

Proposal to add two numbers for Phoenician to the the UCS.

Requester's name

Michael Everson

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

Individual contribution.

4. Submission date

2007-07-25

5. Requester's reference (if applicable)

6. Choose one of the following:

6a. This is a complete proposal

Yes.

6b. More information will be provided later

No.

B. Technical – General

1. Choose one of the following:

1a. This proposal is for a new script (set of characters)

No.

1b. Proposed name of script

1c. The proposal is for addition of character(s) to an existing block

Yes.

1d. Name of the existing block

Phoenician.

2. Number of characters in proposal

2.

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 C.

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, Fontographer.

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.)?

No.

2b. If YES, with whom?

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?

Semiticists and other scholars.

4a. The context of use for the proposed characters (type of use; common or rare)
Historical use.
4b. Reference
5a. Are the proposed characters in current use by the user community?
Yes.
5b. If YES, where?
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?