Proposal **L2/03-158R**

PROPOSAL SUMMARY FORM

A. Administrative

1. Title:
Proposal for encoding Greek numerical characters in the UCS
2. Requester's name:
Thesaurus Linguae Graecae Project (University of California, Irvine)
3. Requester type:
Expert contribution
4. Submission date:
2003-06-11
5. Requester's reference
6. Completion
This is a complete proposal.

B. Technical - General

1a. The proposal is for addition of character(s) to a new block:
Name of the block:
Ancient Greek Numerical Characters
2. Number of characters in proposal:
21
3. Proposed category
Category C
4. Proposed Level of Implementation (1, 2 or 3):
Level 1
5a. Character names provided?
Yes.
5b. Character names in accordance with guidelines
Yes.
5c. Character shapes reviewable?
Yes
6a. Who will provide the appropriate computerized font for publishing the standard?
TLG Project and David Perry
6b. Fonts currently available.
Yes.
6c. Font format
True Type
7a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?
Yes
7b. Are published examples of use of proposed characters attached?
Yes.
8. Does the proposal address other aspects of character data processing?
No.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?

No.

2. Has contact been made to members of the user community?

Yes. The TLG has been in contact with experts in the field of Classics. Earlier versions of this proposal have been posted online and received comments by members of the profession. Proposal was reviewed by Dr. John Mansfield, Cornell University, Professor Jeffrey Rusten, Cornell University, Professor Roger Bagnall, Columbia University.

3. Information on the user community for the proposed characters

Scholarly community.

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

Use varies.

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

Yes. Characters are present primarily in ancient papyri and their modern editions. Used extensively by scholars of Greek.

6. After giving due considerations to the principles in *Principles and Procedures document*, must the proposed characters be entirely in the BMP?

No.

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

Yes.

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

No.

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

No.

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

A few glyph variants are similar to existing characters.

11a. Does the proposal include use of combining characters and/or use of composite sequences

No.

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

No.

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

No.

Introduction

Ancient Greeks used primarily alphabetic characters to represent numbers. A number of non-alphabetic symbols were also used and those are not currently present in the Unicode Standard. This proposal contains 21 Greek Numerical (non-alphabetic) characters. A transcribed papyrus which utilizes many of the characters proposed is appended to the end of this document.

These numerical characters appear in a large number of ancient papyri. They are the standard symbols used for the representation of numbers, fractions, weights and measures and have consistently been used in modern editions of Greek papyri as well as various publications related to the study and interpretation of ancient documents. The proposed characters are already present in existing non-Unicode Greek fonts and used consistently by the scholarly community.

The property for all characters is “Symbol, other” (So).

Standard Ancient Greek Numerical Symbols

Fractions

Name		Unicode	Glyph Variants, Notes, and Examples
Greek Half Symbols			Versions without Unicode codepoints:  Glyph variants with Unicode codepoints: ∠ 2220 (Sm) ∟ 221F (Sm) Example: Kenyon 2.10
Greek Two-Thirds Symbol			Example: Hultsch 1.83
Greek Three-Quarters Symbol			Lower bulb descends slightly below line. Example: Kenyon 1.143

Weights, Measures and Money: Standard Greek Measure of Time

Greek Year Symbol			Descends slightly below line. May also be used as number signifier, half (but not in texts with Greek Half Symbol) or Drachma (but not in texts with Greek Drachma Symbol). Very commonly appears in texts with Greek Half Symbol and Greek Drachma Symbol, therefore not a glyph variant. Example: Kenyon 2.122

Weights, Measures and Money: Standard Greek Weights and Money[1]

The ancient Greeks had two systems of measurement: one for wet, and one for dry products. The *kotyle*, which is the basic measure in both wet and dry systems, is made up of six *kyathoi* or four *oxybapha*. Its value is different depending on local variations, but it is roughly 1/4l.[2]

Greek Talent Symbol			Glyph variants:  and . 22BC and 2305 are similar to , however these two characters have mathematical properties.1 Talent is *c*.25.75kg and 6,000 Drachmas. Example: Bilabel 2307
Greek Large Stater Symbol	Σ	03A3	1 Large Stater is *c*. 860g and 200 Drachmas
Greek Mna	-	-	No standard Character. 1 Mna is *c*. 430g and 100 Drachmas.

[1] Ancient Greeks used the same terminology for weights and currency. Many local variations existed but the Attic-Euboic system appears to have been dominant and this is the system presented in the table below.

[2] Pryce, F.N., Lang, M.L. & Vickers, M. in OCD[3] (1996) 943

Greek Small Stater Symbol	Σ	03A3	1 Small Stater is *c*. 8.6g and 2 Drachmas
Greek Drachma Symbol	≼		Glyph variants: ≼ 22D6 (Sm) < 003C Λ̥ 039B + 0325 1 Drachma is *c*.4.3g. Not the same as the currency symbol. Example: Heiberg 2.29
Greek Obol Symbol	⏑		Glyph variants: ~ 007E ⏑ 223D (Sm) (but needs to match 007E) \ 002F – 2013 1 Obol is c. 0.7g and one sixth of a Drachma. Example: Hultsch 1.220 and Kenyon 1974: 129
Greek Two Obols Symbol	⪷		Glyph variants: ⪷ ≈ 2248 (Sm) = 003D Example: Hultsch 1.226
Greek Three Obols Symbol	⌒		Glyph variants: ⌒ (Descends slightly below line.) Γ 0393 ʃ 0283 T 03A4 ∿ 223F (Sm) Example: Kenyon 1.142, Bilabel 1923:2306, 2314
Greek Four Obols Symbol	⏜		Descends slightly below line. Example: Kenyon 1.142
Greek Five Obols Symbol	⏦		Descends slightly below line. Example: Kenyon 1.142

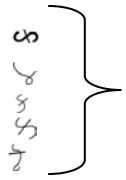
Weights, Measures and Money: Standard Greek Measures of Capacity

Greek Metretes Symbol	Ⱡ		Liquid measure. 1 Metretes is *c*. 35l and 144 liquid Kotyles. Example: Kenyon 1.153
Greek Chous Symbol	χ^{o}	03C7 <superscript> 03BF	Liquid measure. 1 Chous is *c*.3l and 12 liquid Kotyles.
Greek Hemichous Symbol	-	-	Liquid measure. 1 Hemichous is *c*.1.5l and 12 liquid Kotyles.
Greek Medimnos Symbol	-	-	Dry measure. 1 Medimnos is *c.* 180l and 768 dry Kotyles.
Greek Hekteus Symbol	-	-	Dry measure. 1 Hekteus is *c.* 30l and 128 dry Kotyles.
Greek Choinix Symbol	-	-	Dry measure. 1 Choinix is *c.* 1l and 4 dry Kotyles

Greek Kotyle Symbol	Κ^{o}	See note	Formed with Greek Kyathos Base Symbol + <superscript> 03BF Both a liquid and a dry measure. 1 Kotyle is *c*. 250ml.
Greek Oxybaphon Symbol	-	-	Both a liquid and a dry measure. 1 Oxybaphon is *c.* 60ml and ¼ Kotyle.
Greek Kyathos Base Symbol	Κ		039A + 0337 Often written with <superscript> 03C5 after it. Dry measure. 1 Kyathos is *c*. 40ml and $^{1}/_{6}$ Kotyle. Example: Hultsch 1.219

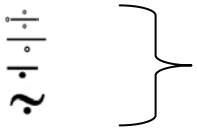
Weights, Measures and Money: Greek Characters for Roman Weights and Measures

Three Greek characters were used to represent weights (and occasionally measures) in the Roman system. The Roman system is based on the Libra or As, of 327.45g. This is divided into 12 Unciae. The Greek translations for these terms are Litra for Libra, and Ounkia[3] for Uncia.

Greek Litra Symbol			Example: Raeder 1.152
Greek Ounkia Symbol			Example: Hultsch 1.220
Greek Xestes Symbol			Versions without Unicode codepoints:  All glyph variants of each other. Preferred form is . Versions with Unicode codepoints:  03BE + 0338 2241 (Sm) Problematic version:  Technically an abbreviation. Example: Hultsch 1.228

[3] Also *Onkia*. See LSJ 1268

Weights, Measures and Money: Greek Characters for non-Graeco-Roman Measures

Greek Artabe Symbol			 All glyph variants of each other. Preferred form is .  (Idiosyncratic) Versions without Unicode codepoints: < 003C ÷ 00F7 Example: Kenyon 2.142
Greek Aroura Symbol			Descends slightly below line. Example: Kenyon 1.143

Weights, Measures and Money: Ancient Greek Medical Measures

Greek Gramma Symbol			Example: Hultsch.1.220
Greek Tryblion Base Symbol			Descends slightly below line. Example: Hultsch.1.221

TABLE xx00-1F: ANCIENT GREEK NUMERICAL

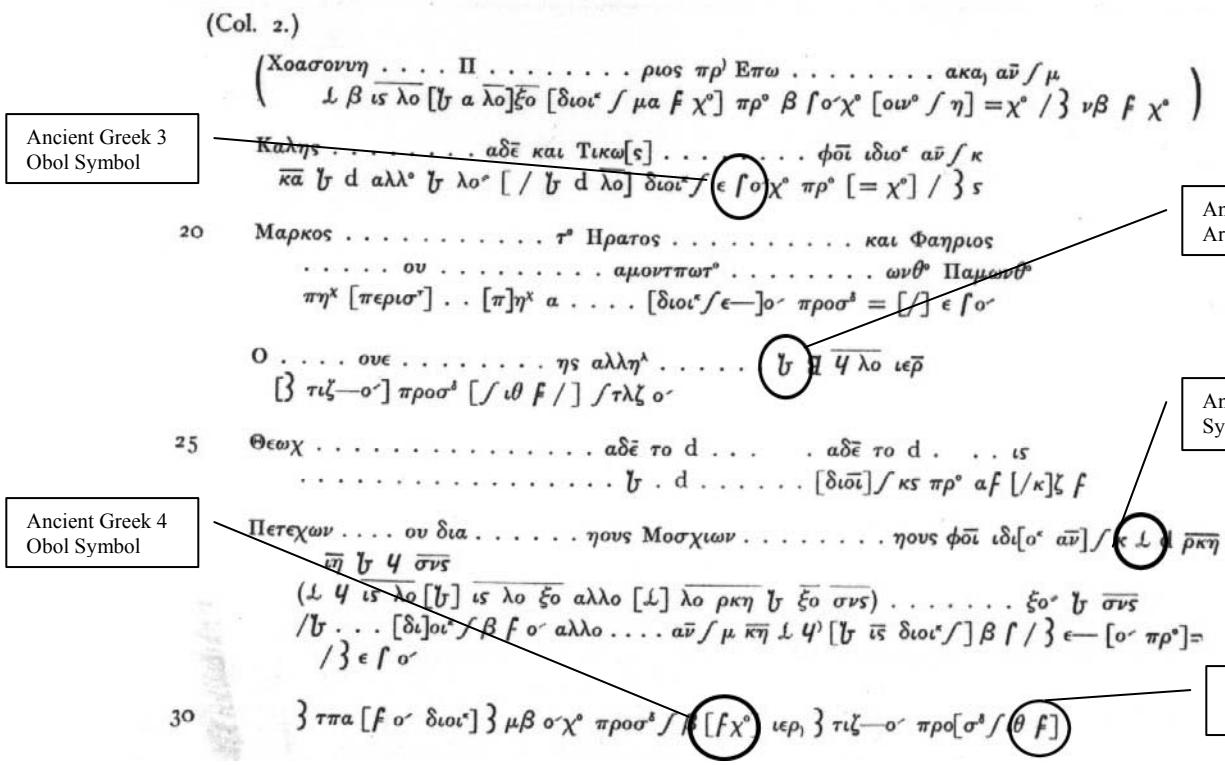
	xx0	xx1
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

TABLE xx00-1F: ANCIENT GREEK NUMERICAL

hex	Name
xx00	GREEK HALF SIGN TYPE ONE
xx01	GREEK HALF SIGN TYPE TWO
xx02	GREEK TWO-THIRDS SIGN
xx03	GREEK THREE-QUARTERS SIGN
xx04	GREEK YEAR SIGN
xx05	GREEK TALENT SIGN
xx06	GREEK DRACHMA SIGN
xx07	GREEK OBOL SIGN
xx08	GREEK TWO OBOLS SIGN
xx09	GREEK THREE OBOLS SIGN
xx0A	GREEK FOUR OBOLS SIGN
xx0B	GREEK FIVE OBOLS SIGN
xx0C	GREEK METRETES SIGN
xx0D	GREEK KYATHOS BASE SIGN
xx0E	GREEK LITRA SIGN
xx0F	GREEK OUNKIA SIGN
xx10	GREEK XESTES SIGN
xx11	GREEK ARTABE SIGN
xx12	GREEK AROURA SIGN
xx13	GREEK GRAMMA SIGN
xx14	GREEK TRYBLION BASE SIGN

Appendix

Example of standard ancient Greek numerical symbols.[4]



[4] Kenyon, F.G., Greek *Papyri in the British Museum* I (London, 1893) 143. Characters found in this image but not in the table below are glyph variants of existing Greek letters or characters proposed below.