L2/03-158

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
(Please read Principles and Procedures Document for guidelines and details before filling this form.)
See http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html **for latest *Form*.**
See http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for latest *Principles and Procedures* document.**
See http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest roadmaps.**

A. Administrative

1. **Title:** **Proposal to encode Greek Numerical characters in the UCS**
2. Requester's name: **Thesaurus Linguae Graecae Project (University of California, Irvine) and UTC**
3. Requester type (Member body/Liaison/Individual contribution): **Expert Contribution**
4. Submission date: **2003-06-11**
5. Requester's reference (if applicable):
6. This is a complete proposal:

B. Technical - General

1. (Choose one of the following:)
   a. This proposal is for a new script (set of characters): _____
      Proposed name of script:.
   b. The proposal is for addition of character(s) to an existing block: **Yes**
      Name of the existing block: **Ancient Greek Numerical Characters (10175-10189)**
2. Number of characters in proposal: **21**
3. Proposed category (see section II, Character Categories): **Category C**
4. Proposed Level of Implementation (1, 2 or 3) (see clause 14, ISO/IEC 10646-1: 2000): **Level 1**
   Is a rationale provided for the choice? **No**
   If Yes, reference:
5. Is a repertoire including character names provided? **Yes**
   a. If YES, are the names in accordance with the 'character naming guidelines in Annex L of ISO/IEC 10646-1: 2000? **Yes**
   b. Are the character shapes attached in a legible form suitable for review? **Yes**
6. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard? **David Perry and TLG Project (True Type)**
   If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used: **TLG Project, mcpantel@uci.edu**
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? **Yes**
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? **Yes**
8. Special encoding issues:
   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)? **No**
9. Additional Information: **The property for these characters is So**

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 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.

[1] Form number: N2352-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? **No**

If YES explain _____

2. 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**

If YES, with whom?

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.

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? **Scholarly community**

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

Reference: **See proposal**

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

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

Reference: **See proposal**

6. After giving due considerations to the principles in *Principles and Procedures document* (a WG 2 standing document) must the proposed characters be entirely in the BMP? **No**

If YES, is a rationale provided?

If YES, reference:

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**

If YES, is a rationale for its inclusion provided? _____

If YES, reference: _____

9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? **No**

If YES, is a rationale for its inclusion provided? _____

If YES, reference: _____

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

A few glyph variants are similar to existing characters.

11. 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**

If YES, is a rationale for such use provided?

If YES, reference: _____

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

If YES, reference: _____

12. Does the proposal contain characters with any special properties such as control function or similar semantics? **No**

If YES, describe in detail (include attachment if necessary) _____

13. Does the proposal contain any Ideographic compatibility character(s)? **No**

If YES, is the equivalent corresponding unified ideographic character(s) identified? _____

If YES, reference: _____

Introduction

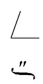
Ancient Greeks used primarily alphabetic characters to represent numbers. A number of non-alphabetic symbols were also used and those are not currently present in the Unicode Standard. This proposal contains 21 Greek Numerical (non-alphabetic) characters. A transcribed papyrus which utilizes many of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

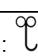
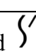
Name		Unicode	Glyph Variants, Notes, and Examples
Greek Symbol One Half			Versions without Unicode codepoints:  Glyph variants with Unicode codepoints: ∠ 2220 (Sm) ∟ 221F (Sm) Example: Kenyon 2.10
Greek Symbol Two-Thirds			Example: Hultsch 1.83
Greek Symbol Three-Quarters			Lower bulb descends slightly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

Weights, Measures and Money: Standard Greek Measure of Time

Greek Symbol Year			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[2]

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.

Greek Symbol Talent			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 Symbol Large Stater	Σ	03A3	1 Large Stater is *c*. 860g and 200 Drachmas
Greek Symbol Mna	-	-	No standard Character. 1 Mna is *c*. 430g and 100 Drachmas.
Greek Symbol Small Stater	Σ	03A3	1 Small Stater is *c*. 8.6g and 2 Drachmas

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[2] 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.

Greek Symbol Drachma	≼		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 Symbol One Obol	⏑		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 Symbol Two Obols	⏑⏑		Glyph variants: ⏑⏑ ≈ 2248 (Sm) = 003D Example: Hultsch 1.226
Greek Symbol Three Obols	⏜		Glyph variants: ⏜ (Descends slightly below line.) Γ 0393 ʃ 0283 T 03A4 ∿ 223F (Sm) Example: Kenyon 1.142, Bilabel 1923:2306, 2314
Greek Symbol Four Obols	⏜⏑		Descends slightly below line. Example: Kenyon 1.142
Greek Symbol Five Obols	⏜⏑⏑		Descends slightly below line. Example: Kenyon 1.142

Weights, Measures and Money: Standard Greek Measures of Capacity

Greek Symbol Metretes	Ⱡ		Liquid measure. 1 Metretes is *c*. 35l and 144 liquid Kotyles. Example: Kenyon 1.153
Greek Symbol Chous	χ^{o}	03C7 <superscript> 03BF	Liquid measure. 1 Chous is *c*.3l and 12 liquid Kotyles.
Greek Symbol Hemichous	-	-	Liquid measure. No standard Character. 1 Hemichous is *c*.1.5l and 12 liquid Kotyles.
Greek Symbol Medimnos	-	-	Dry measure. No standard Character. 1 Medimnos is *c.* 180l and 768 dry Kotyles.
Greek Symbol Hekteus	-	-	Dry measure. No standard Character. 1 Hekteus is *c*. 30l and 128 dry Kotyles.
Greek Symbol Choinix	-	-	Dry measure. No standard Character. 1 Choinix is *c.* 1l and 4 dry Kotyles
Greek Symbol Kotyle	Ⱪ^{o}	See note	Formed with Greek Kyathos Base Symbol + <superscript> 03BF Both a liquid and a dry measure. 1 Kotyle is *c*. 250ml.

Greek Symbol Oxybaphon	-	-	Both a liquid and a dry measure. No standard Character. 1 Oxybaphon is *c.* 60ml and ¼ Kotyle.
Greek Symbol Kyathos Base	𐅵		039A + 0337 Often written with <superscript> 03C5 after it. Dry measure. 1 Kyathos is *c*. 40ml and $^1/_6$ Kotyle. Example: Hultsch 1.219

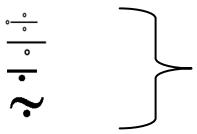
Weights, Measures and Money: Greek Characters for Roman Weights and Measures

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 Symbol Litra	𐅂		Example: Raeder 1.152
Greek Symbol Ounkia	𐅁		Example: Hultsch 1.220
Greek Symbol Xestes	ↄ		Versions without Unicode codepoints: ↄ ↄ ↄ ↄ ↄ All glyph variants of each other. Preferred form is ↄ . Versions with Unicode codepoints: ↄ 03BE + 0338 ↄ 2241 (Sm) Problematic version: ↄ 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 Symbol Artabe			 All glyph variants of each other. Preferred form is .  (Idiosyncratic) Versions without Unicode codepoints: < 003C ÷ 00F7 Example: Kenyon 2.142
Greek Symbol Aroura			Descends slightly below line. Example: Kenyon 1.143

Weights, Measures and Money: Ancient Greek Medical Measures

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

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TABLE 10175: ANCIENT GREEK NUMERICAL

	1017	1018
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

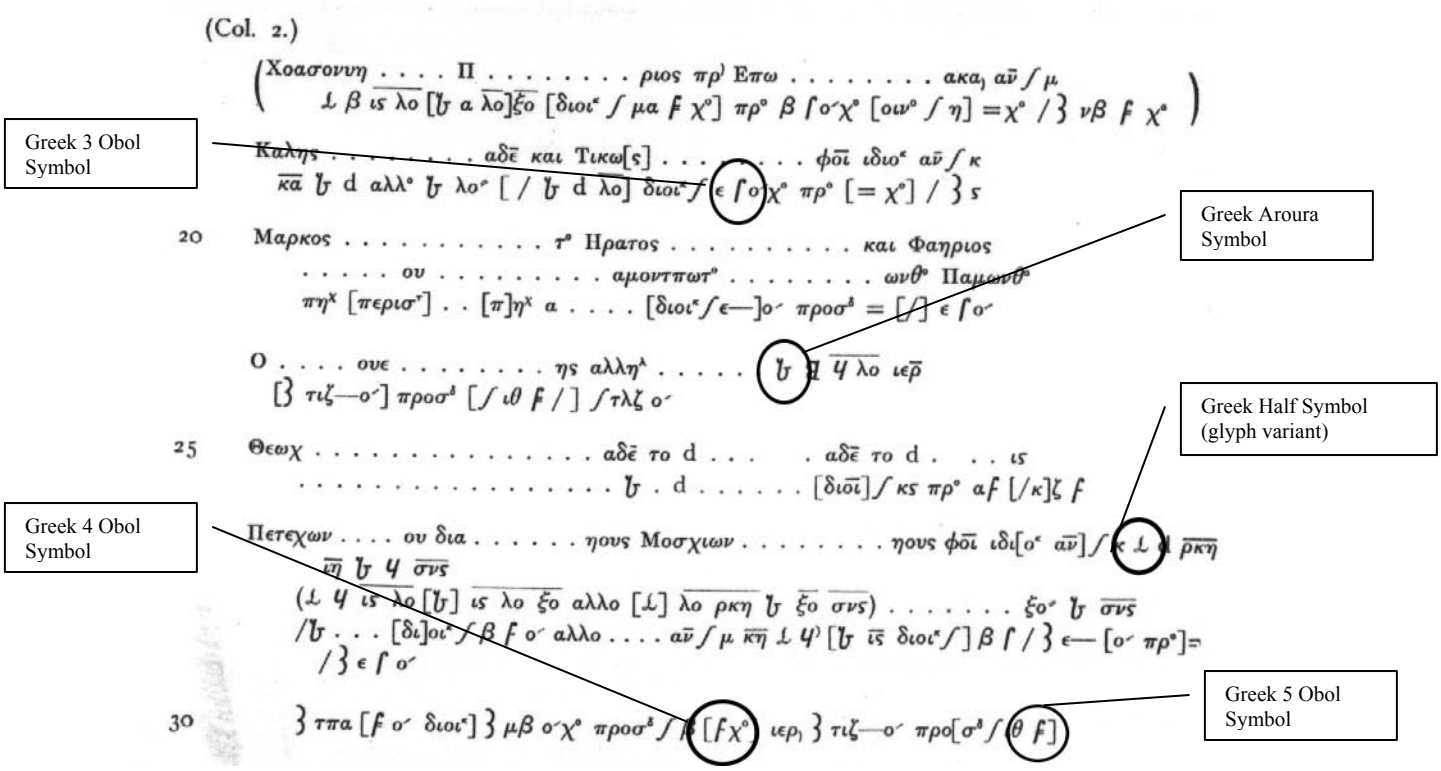
TABLE xx00-1F: ANCIENT GREEK NUMERICAL

hex	Name
10175	GREEK SYMBOL HALF TYPE ONE
10176	GREEK SYMBOL HALF TYPE TWO
10177	GREEK SYMBOL TWO-THIRDS
10178	GREEK SYMBOL THREE-QUARTERS
10179	GREEK SYMBOL YEAR
1017A	GREEK SYMBOL TALENT
1017B	GREEK SYMBOL DRACHMA
1017C	GREEK SYMBOL OBOL
1017D	GREEK SYMBOL TWO OBOLS
1017E	GREEK SYMBOL THREE OBOLS
1017F	GREEK SYMBOL FOUR OBOLS
10180	GREEK SYMBOL FIVE OBOLS
10181	GREEK SYMBOL METRETES
10182	GREEK SYMBOL KYATHOS BASE
10183	GREEK SYMBOL LITRA
10184	GREEK SYMBOL OUNKIA
10185	GREEK SYMBOL XESTES
10186	GREEK SYMBOL ARTABE
10187	GREEK SYMBOL AROURA
10188	GREEK SYMBOL GRAMMA
10189	GREEK SYMBOL TRYBLION BASE

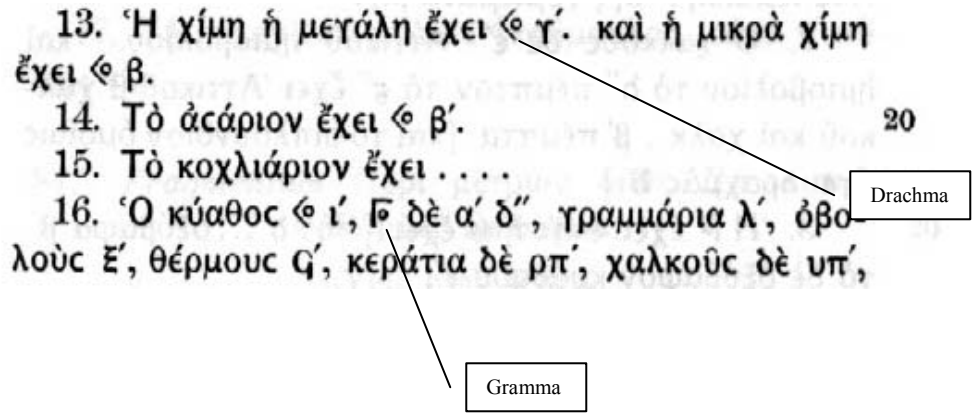
Appendix

Examples of standard ancient Greek numerical symbols.

Example 1.[4]

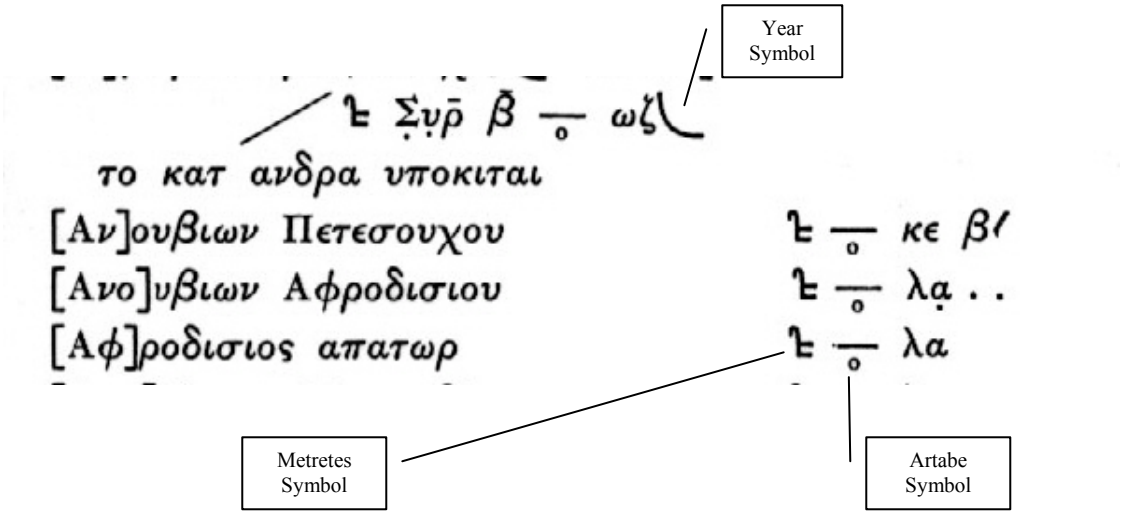


Example 2.[5]

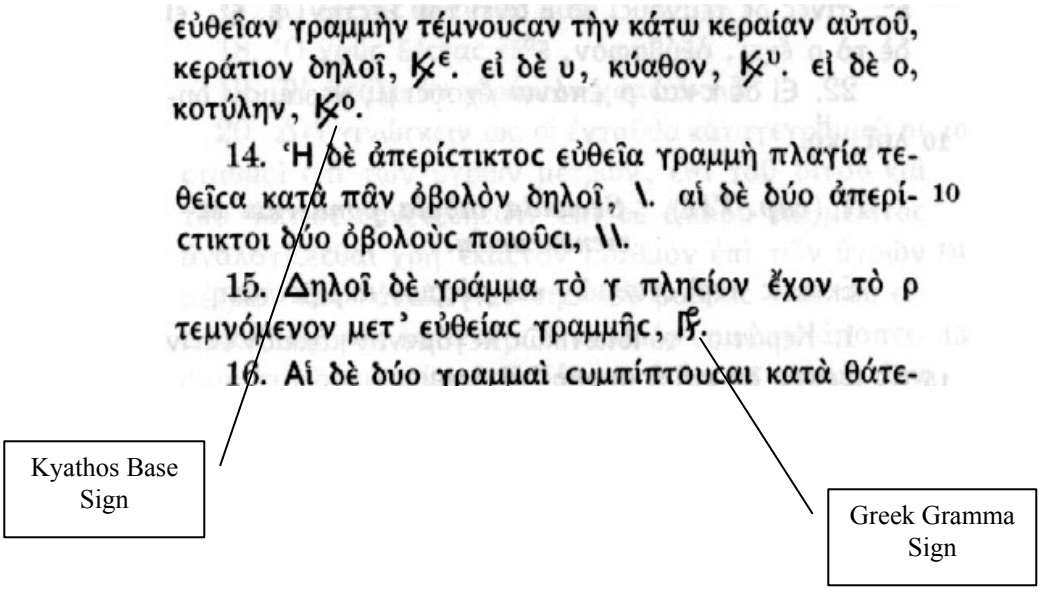


[4] Kenyon, F.G., *Greek Papyri in the British Museum* I (London, 1893) 143. Characters found in this image but not in the table below are glyph variants of existing Greek letters or characters proposed below.
[5] Hultsch, F., *Metrologocorum scriptorum reliquae* (Stuttgart, 1971) 255

Example 3.[6]



Example 4.[7]



[6] Kenyon, F.G., *Greek Papyri in the British Museum* I (London, 1893) 98

[7] Hultsch, F., *Metrologocorum scriptorum reliquae* (Stuttgart, 1971) 227