

**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:**

2002-11-07

**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:**

17 new characters

**3. Proposed category**

Categories 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

**6b. Fonts currently available.**

None

**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.

**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. Some characters are very common. Some appear less often.

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

Yes. Characters are present primarily in ancient manuscripts and modern editions of Greek texts and 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?**

No.

**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.

## Proposal

This section of the proposal is divided into two subsections.

1. Alphabetic Numerals
2. Weights, Measures and Money

### 1. Alphabetic Numerals – Fractions

In order to display and discuss ancient Greek mathematical works accurately, two additional characters will need to be added to the Unicode Standard: the Greek Half and Greek Two-Thirds Signs.<sup>1</sup>

### 2. Weights, Measures and Money

#### *Weights and Money*

Ancient Greeks used the same terminology and abbreviations for weights and currency. Therefore both systems are discussed together in this section. The system had many local variations, but the Attic-Euboic system appears to have been dominant and this is the system presented in the table below:

Scale <sup>2</sup>	Nominal	Post-Hippias (standard)	Unicode
6000	Talent	c. 25.74kg	
200	(Large) Stater	c. 858.00g	03A3 or 03DE
100	Mna	c. 429.00g	
2	(Small) Stater/ Didrachmon	c. 8.58g	03A3 or 03DE
1	Drachma	c. 4.29g	
<sup>1</sup> / <sub>6</sub>	Obol	c. 0.72g	

#### *Measures of Capacity*

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 <sup>1</sup>/<sub>4</sub>l.<sup>3</sup>

---

<sup>1</sup> Heath (Heath (1921:1) 41-2) writes: “The Greeks had a preference for expressing ordinary proper fractions as the sum of two or more submultiples... The orthodox sign for a submultiple was the letter for the corresponding number (the denominator) but with an accent instead of a horizontal stroke above it; thus  $\gamma\acute{\square} = \square \dots$  There were special signs for  $\frac{1}{2}$  namely  $\lambda'$  or  $C'$ , and for  $\square$ , namely  $\Omega'$ . When a number of submultiples are written one after the other, the sum of them is meant, and similarly when they follow a whole number; e.g.  $\lambda'\delta' = \frac{1}{2} \frac{1}{4}$  or  $\frac{3}{4} \dots$ ;  $\kappa\theta \Omega' \iota\psi' \lambda\theta' = 29 \square \frac{1}{13} \frac{1}{39}$  or  $29 \frac{10}{13}$ .”

<sup>2</sup> This table is based on that in Viedebantt (1923) 38

<sup>3</sup> Pryce, F.N., Lang, M.L. & Vickers, M. in OCD<sup>3</sup> (1996) 943

### The dry measures

Scale	Nominal	Approximate weight	Unicode
$\frac{1}{6}$	Kyathos	c.40ml	
$\frac{1}{4}$	Oxybaphon	c.60ml	No standard character
1	Kotyle	c.240ml	
4	Choinix	c.1l	No standard character
128	Hekteus	c.30l	No standard character
768	Medimnos	c.180l	No standard character

### The liquid measures

Scale	Nominal	Approximate weight	Unicode
$\frac{1}{6}$	<i>Kyathos</i>	<i>c.40ml</i>	
$\frac{1}{4}$	<i>Oxybaphon</i>	<i>c.60ml</i>	No standard character
1	<i>Kotyle</i>	<i>c.240ml</i>	
6	Hemichous	c.1.5l	No standard character
12	Chous	c.3l	03C7 + <superscript> 03BF
144	Metretes	c.35l	

### Characters for Roman Weights and Measures

Three characters are included in this sub-section. These characters are the Greek characters used to represent weights (and occasionally also 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*<sup>4</sup> for *Uncia*.

## Bibliography

- Avi-Yonah, M., "Abbreviations in Greek Inscriptions (The Near East, 200 B.C.-A.D. 1100)." in Oikonomides, A.N. (ed.), *Abbreviations in Greek: Inscriptions, Papyri, Manuscripts and Early Printed Books*. (Chicago 1974)
- Hiller von Graetringen, F., *Inscriptiones Graecae I. Editio Minor* (Berlin, 1924)
- Jeffery, L.H., *The Local Scripts of Archaic Greece* (Oxford, 1961)
- Kirchner, J., *Inscriptiones Graecae II/III.1* (Berlin, 1913)
- Larfeld, W., *Handbuch der griechischehn Epigraphik 2.2. Die attischen Inschriften* (Leipzig, 1902)
- O. Montevecchi, *La Papirologia* (Milan, 1988)
- Oikonomides, A. N. (ed), *Abbreviations in Greek Inscriptions: Papyri, Manuscripts and Early Printed Books* (Chicago, 1974)
- Packard Humanities Institute (PHI) CD-ROM 7.0 (Packard Humanities Institute, 1996)
- Pririe, J.W., Jeffery, L.H. & Johnston, A.W., "Alphabet, Greek" in *OCD*<sup>3</sup> (1996) 66
- Pryce, F.N., Lang, M.L. & Vickers, M. "Measures" in *OCD*<sup>3</sup> (1996) 942-3
- Radke, G., "Tryblion" in *Paulys Realencyclopädie der classischen Altertumswissenschaft* 2.13 (1939) 710-11

---

<sup>4</sup> Also *Onkia*. See LSJ 1268

## Ancient Greek Numerical Characters: Characters Proposed

	Name	Comments
<b>Alphabetic Numerals – Fractions</b>		
1	∟	Greek Half Sign Glyph variants: ∟, ∟, C, ∟, C, ∟, s, s, S, L and C'. 2220 is identical to one glyph variant, however this character has mathematical properties.
2	ω	Greek Two-Thirds Sign
<b>Weights, Measures and Money: Standard Greek Weights and Money</b>		
3	∟	Greek Talent Sign Glyph variants: ∟ and ∟. 22BC and 2305 are similar to ∟, however these two characters have mathematical properties.
4	∟	Greek Drachma Sign Glyph variants: <, ∟. 22D6, 003C and 039B are similar to three of the glyph variants; however 22D6 has mathematical properties.
5	~	Greek Obol Sign Glyph variants: ~, ~ and \. Kenyon also records a fourth: -. <sup>5</sup> 007E, 223D, 005C and 2013 are similar to four glyph variants; however 223D has mathematical properties.
6	≈	Greek Two Obols Sign Glyph variants: ≈, ≈, =. <sup>6</sup> 2248 is similar to one glyph variant, however this character has mathematical properties.
7	∟	Greek Three Obols Sign Glyph variants: ∟, ∟, ∟, T and ∟. <sup>7</sup> 0393, 03A4 and 223F are similar to three glyph variants, however 223F has mathematical properties.
8	∟	Greek Four Obols Sign
9	∟	Greek Five Obols Sign
<b>Weights, Measures and Money: Standard Greek Measures of Capacity</b>		
10	∟	Greek Metretes Sign
11	∟	Greek Kyathos Base Sign
<b>Weights, Measures and Money: Greek Characters for Roman Weights and Measures</b>		
12	∟	Greek Litra Sign Glyph variant: ∟.
13	∟	Greek Ounkia Sign
14	∟	Greek Xestes Sign Glyph variants: ∟, ∟, ∟, ∟, ∟, ∟, ∟, ∟ and ∟.
<b>Weights, Measures and Money: Greek Characters for non-Graeco-Roman Measures</b>		
15	∟	Greek Artabe Sign Other glyph variants: <, ∟, ∟, ∟, ∟ and ∟. 00F7 is similar to one glyph variant.
<b>Weights, Measures and Money: Ancient Greek Medical Measures</b>		
16	∟	Greek Gramma Sign
17	∟	Greek Tryblion Base Sign

<sup>5</sup> Kenyon (1974) 129

<sup>6</sup> Kenyon (1974) 129

<sup>7</sup> Bilabel (1923) 2308, 2314


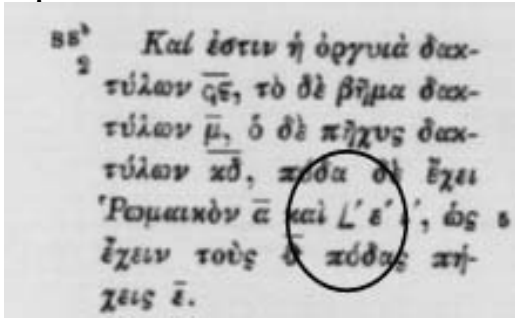
**TABLE xx01-3F: GREEK NUMERICAL CHARACTERS**

	xx0	xx1	xx2	xx3
0	∟	Ϡ		
1	ω			
2	Ϟ			
3	∨			
4	Ϸ			
5	ϸ			
6	ϣ			
7	Ϥ			
8	ϥ			
9	Ϧ			
A	ϧ			
B	Ϩ			
C	ϩ			
D	Ϫ			
E	ϫ			
F	Ϭ			

**TABLE xx01-3F: GREEK NUMERICAL CHARACTERS**

hex	Name
xx00	Greek Half Sign
xx01	Greek Two-Thirds Sign
xx02	Greek Talent Sign
xx03	Greek Drachma Sign
xx04	Greek Obol Sign
xx05	Greek Two Obols Sign
xx06	Greek Three Obols Sign
xx07	Greek Four Obols Sign
xx08	Greek Five Obols Sign
xx09	Greek Metretes Sign
xx0A	Greek Kyathos Base Sign
xx0B	Greek Litra Sign
xx0C	Greek Ounkia Sign
xx0D	Greek Xestes Sign
xx0E	Greek Artabe Sign
xx0F	Greek Gramma Sign
xx10	Greek Tryblion Base Sign
xx11	(The remaining codepoints are reserved for
xx12	Acrophonic Numerals)
xx13	
xx14	
xx15	
xx16	
xx17	
xx18	
xx19	
xx1A	
xx1B	
xx1C	
xx1D	
xx1E	
xx1F	
xx20	
xx21	
xx22	
xx23	
xx24	
xx25	
xx26	
xx27	
xx28	
xx29	
xx2A	
xx2B	
xx2C	
xx2D	
xx2E	
xx2F	
xx30	
xx31	
xx32	
xx33	
xx34	
xx35	
xx36	
xx37	
xx38	
xx39	
xx3A	
xx3B	

# 1. Ancient Greek Half Sign



<b>Sign</b>  	<b>Similar Unicode</b> See below
<p><b>Definition and comments</b></p> <p>This is the standard ancient Greek mathematical abbreviation for one half, and occurs highly frequently in extant sources.</p> <p>The TLG has recorded several glyph variants: <math>\angle</math>, <math>\cup</math>, <math>\complement</math>, <math>\smile</math>, <math>\frown</math>, <math>\mathfrak{s}</math>, <math>\mathfrak{z}</math>, <math>\mathfrak{z}</math>. The first is an angle, the second and third are curved variants. The fourth and the fifth show this symbol being read as a Lunate Sigma; the remaining three are variants which read the character as a non-Lunate Sigma. Friedlein notes two more variants: <math>\perp</math> and <math>\complement</math>.<sup>8</sup></p> <p>There are Unicode characters similar to four glyph variants:</p> <ul style="list-style-type: none"> <li><math>\perp</math> - 221F (however, this character has mathematical properties)</li> <li><math>\angle</math> - 2220 (however, this character has mathematical properties)</li> <li><math>\cup</math> - 25E1</li> <li><math>\mathfrak{s}</math> - 0073</li> </ul> <p>A fifth glyph is identical to the Capital Lunate Sigma, proposed above.<sup>9</sup></p>	
<p><b>Example 1</b>  <b>Heron Mech., <i>Geometrica</i>. Chapter 4 section 2</b></p>  <p>Heiberg, J.L., <i>Heronis Alexandrini opera quae supersunt omnia</i>, vol. 4 (Teubner, Leipzig, 1903) 184</p>	

<sup>8</sup> Friedlein (1869) Tafel 2




<sup>9</sup> See Oikonomides (1974) 130; Heath (1921:1) 42



## 2. Greek Two-Thirds Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<p><b>Definition and comments</b></p> <p>This is the standard ancient Greek mathematical abbreviation for two thirds.</p> <p>This character is 03C9 GREEK SMALL LETTER OMEGA with a curl at the right hand side. Hultsch describes this symbol as a contraction of the symbol for a half (which he gives as C) together with the symbol for a sixth. So Cζ' becomes .<sup>10</sup> Kenyon, however, regards this symbol as ο.<sup>11</sup> In any case, this is a distinct, commonly used mathematical symbol and should not be regarded as a ligature of other characters since it has developed its own distinct and independent form.</p> <p>This symbol has one main glyph variant. Hultsch records the use of 03B2 GREEK SMALL CASE BETA (β) to mean two thirds, and the TLG has recorded the use of 03B2 GREEK SMALL CASE BETA + 0338 COMBINING LONG SOLIDUS OVERLAY (β̄) for the same symbol. The omega-like symbol is the more common. The TLG records 81 instances of the Omega variant in four authors and 31 of the Beta variant in two authors.</p>	
<p><b>Example 1</b></p> <p>Cleopatra Alchem., <i>De ponderibus et mensuris</i>. Fragment 78 section 4</p> <div data-bbox="422 777 1193 934" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>20 4. Ἡ δραχμὴ ἔχει γραμμάρια γ', ὀβολοὺς ε', θεράμους θ', κεράτια ιη', χαλκοὺς μη', νομίσματος ω' καὶ ιβ". καὶ τὸ Ἰταλικὸν δηνάριον ἔχει δραχμὴν α' ἢ δραχμὴ δὲ καὶ ἄλλη ὁμώνυμος καλεῖται ἡ Αἴγυπτιακή.</p> </div> <p>Hultsch, F., <i>Metrologicorum scriptorum reliquiae</i>, vol. 1 (Teubner, Leipzig, 1864) 154</p>	

## 3. Greek Talent Sign

<b>Sign</b> 	<b>Similar Unicode</b> See below
<p><b>Definition and comments</b></p> <p>A Talent consists of 6,000 Drachmas and is a weight of approximately 25.74kg in the standard Attic system.</p> <p>This character is formed from the horizontal bar of 03A4 GREEK CAPITAL LETTER TAU placed over a slightly shortened 039B GREEK CAPITAL LETTER LAMBDA which are the first and third letters of the word Talent. Hultsch also records the abbreviation T<sup>Λ</sup> for Talent.<sup>12</sup> Example 1 below shows the standard abbreviation as well as a series of further glyph variants. Montevecchi lists two further glyph variants:  and .<sup>13</sup></p> <p>This character is visually similar but not identical to 22BC NAND and 2305 PROJECTIVE (also these characters also have mathematical properties). However, with the Talent, there is no space in between the arrow and the horizontal line.</p>	

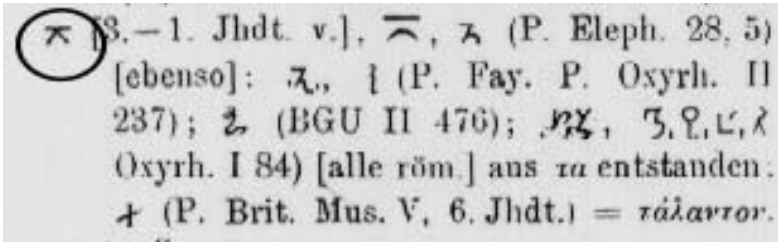
<sup>10</sup> Hultsch (1864:1) 174

<sup>11</sup> Kenyon (1974) 130

<sup>12</sup> Hultsch (1871:2) xxx

<sup>13</sup> Montevecchi (1988) 476

**Example 1**  
**Talent and glyph variants**



Bilabel, “Siglae” in *Pauly’s Real-Encyclopädie der classischen Altertumswissenschaft. Zweite Reihe. Zweiter Band* (Stuttgart, 1923) 2315

**4. Greek Drachma Sign**

Sign	Similar Unicode
<	See below

**Definition and comments**

A Drachma, which consists of six Obols and is a weight of approximately 4.31g in the standard Attic system is a common character in extant Greek texts. The two examples below are extracts from medical texts giving weight measures.

The TLG records three glyph variants of this character: <, < and Λ. The second and third glyph variants may currently be encoded in Unicode:

< 003C

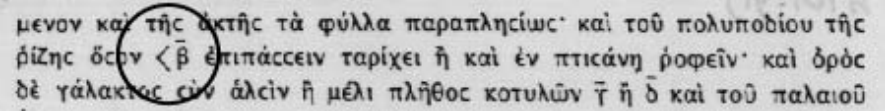
Λ 039B with 0325

However, there is no satisfactory Unicode for the most common glyph variant:

< 22D6 (this character has mathematical properties)

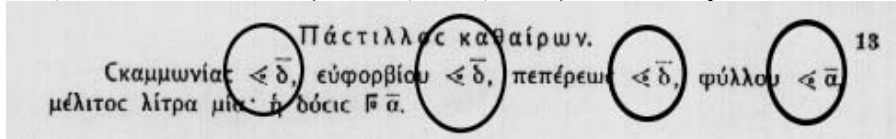
Montevecchi records two further glyph variants: ⇐ and ⤵.<sup>14</sup>

**Example 1**  
**Paulus Med., *Epitomae medicae libri septem. Book 1 chapter 43 section 1***



Heiberg, J.L., *Paulus Aegineta*, vol. 2 (Teubner, Leipzig, 1921) 29


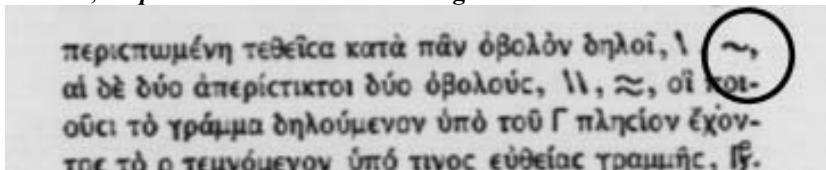
**Example 2 (glyph variant)**  
**Oribasius Med., *Collectiones medicae (lib. 1-16, 24-25, 43-50). Book 8 chapter 47 section 14***




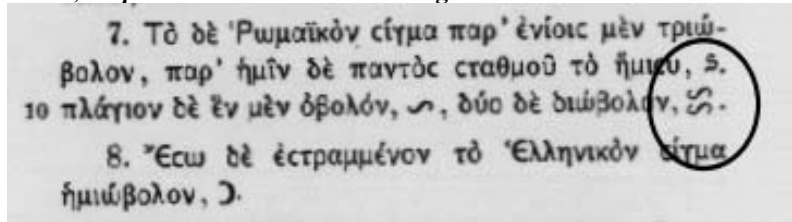
Raeder, J., *Oribasii collectionum medicarum reliquiae*, vol. 1 (Teubner, Leipzig, 1928) 299

<sup>14</sup> Montevecchi (1988) 476

## 5. Greek Obol Sign

<b>Sign</b> 	<b>Similar Unicode</b> See below						
<b>Definition and comments</b> The Obol is the smallest standard Greek weight measure and weighs approximately 0.72g in the standard Attic system.  The TLG records three glyph variants: ~, ~ and \. Kenyon also records a fourth: -. <sup>15</sup> Three of these glyph variants may be satisfactorily encoded in Unicode:  <table data-bbox="324 514 487 661"> <tr> <td>~</td> <td>007E</td> </tr> <tr> <td>\</td> <td>005C</td> </tr> <tr> <td>-</td> <td>2013</td> </tr> </table> The second, ~, is similar to 223D; however, this character has mathematical properties.		~	007E	\	005C	-	2013
~	007E						
\	005C						
-	2013						
<b>Example 1</b> <b>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 52 section 4</b>  Hultsch, F., <i>Metrologicorum scriptorum reliquiae</i> , vol. 1 (Teubner, Leipzig, 1864) 220							


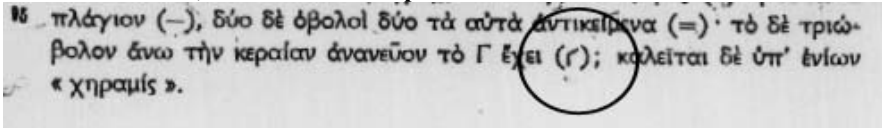
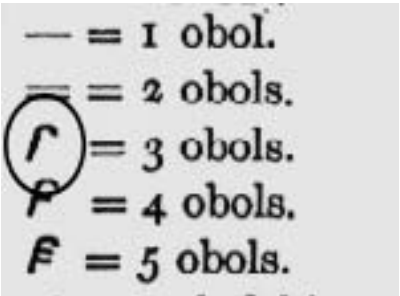
## 6. Greek Two Obols Sign

<b>Sign</b> 	<b>Similar Unicode</b> See below
<b>Definition and comments</b> Two Obols weighs approximately 1.43g in the standard Attic system.  The TLG records two glyph variants: ≈ and ≈. Kenyon also records a third =. <sup>16</sup> The second of these glyph variants, ≈, may currently be encoded in Unicode with 2248; however, this character has mathematical properties.	
<b>Example 1</b> <b>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 56b section 7</b>  Hultsch, F., <i>Metrologicorum scriptorum reliquiae</i> , vol. 1 (Teubner, Leipzig, 1864) 226	

<sup>15</sup> Kenyon (1974) 129



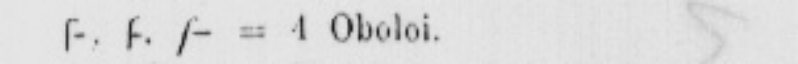
<sup>16</sup> Kenyon (1974) 129

## 7. Greek Three Obols Sign



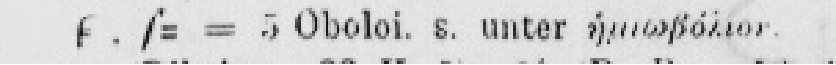
<b>Sign</b> 	<b>Similar Unicode</b> See below
<p><b>Definition and comments</b></p> <p>Three Obols weigh approximately 2.12g in the standard Attic system.</p> <p>The TLG records only one glyph variant (see Example 1 below); Bilabel records four further variants: Γ, ϸ, Ϲ, T and √.<sup>17</sup> None of these can currently be encoded using Unicode. Three preexisting Unicode codepoints are similar but not suitable for the triobolon:</p> <p>Γ      0393 GREEK CAPITAL LETTER GAMMA. The three Obols sign may not have serifs, so cannot be considered unified with the gamma.</p> <p>T      03A4 GREEK CAPITAL LETTER TAU. The three Obols sign may not have serifs, so cannot be considered unified with Tau.</p> <p>√      223F SINE WAVE. The three Obols sign takes up the whole line in terms of height. Further, this character has mathematical properties.</p>	
<p><b>Example 1</b>          Sextus Julius Africanus <i>Hist., Cesti. Book 4 chapter 1</i></p>  <p>Vieillefond, J.-R., <i>Les "Cestes" de Julius Africanus</i> (Sansoni, Florence, 1970) 275</p> <p><b>Example 2</b></p>  <p>Kenyon, F.G. "Abbreviations and symbols in Greek papyri" in Oikonomides, A.N., (ed.) <i>Greek Abbreviations</i> (Chicago, 1974) 129</p>	

<sup>17</sup> Bilabel (1923) 2308, 2314


## 8. Greek Four Obols Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> Four Obols weigh approximately 2.86g in the standard Attic system. Bilabel and Kenyon record glyph variants which are all virtually identical:  <sup>18</sup> The character cannot be encoded in the current Unicode Standard.	
<b>Example 1</b> <b>Four Obols and glyph variants</b>  Bilabel, “Siglae” in <i>Pauly’s Real-Encyclopädie der classischen Altertumswissenschaft. Zweite Reihe. Zweiter Band</i> (Stuttgert, 1923) 2315	

## 9. Greek Five Obols Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> Five Obols weigh approximately 3.58g in the standard Attic system. Bilabel and Kenyon record glyph variants which are all virtually identical:  <sup>19</sup> This symbol does not currently exist in the Unicode Standard.	
<b>Example 1</b> <b>Five Obols and glyph variants</b>  Bilabel, “Siglae” in <i>Pauly’s Real-Encyclopädie der classischen Altertumswissenschaft. Zweite Reihe. Zweiter Band</i> (Stuttgert, 1923) 2315	


## 10. Greek Metretes Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> Kenyon records this as the standard symbol for the Greek liquid measure, the Metretes, which is approximately 35l. This character is 03DC GREEK DIGAMMA reflected in the x-axis.	

<sup>18</sup> Bilabel (1923) 2308 & 2314 and Kenyon (1974) 129

<sup>19</sup> Bilabel (1923) 2308 & 2314 and Kenyon (1974) 129

### Example 1



Ϝ = μετρητής.

Kenyon, F.G. “Abbreviations and symbols in Greek papyri” in Oikonomides, A.N., (ed.) *Greek Abbreviations* (Chicago, 1974) 129

## 11. Greek Kyathos Base Sign

Sign	Similar Unicode
Ϝ	See below

### Definition and comments

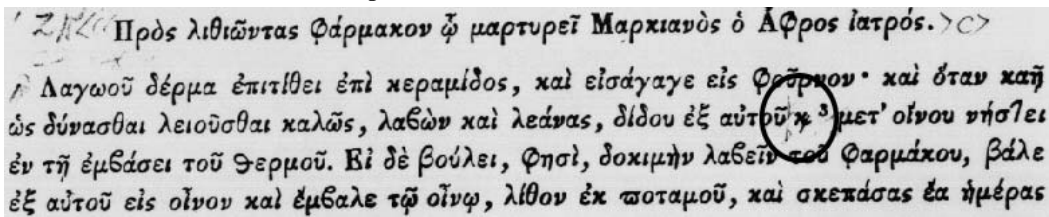
“carat, 1/1728 of a pound” (LSJ 941).

This character forms the first part of the characters used to form three measures: the Kyathos, the Kotyle and some glyph variants of the Keration. This character is conventionally followed by a superscripted upsilon (for the second letter of Kyathos) or omicron (the second letter of Kotyle) or epsilon (the second letter of Keration). These letters may also appear above this character.

This is also an archaic form of 03D7 GREEK KAI SYMBOL

### Example 2

Aëtius Med., *Iatricorum liber xi*. Chapter 11

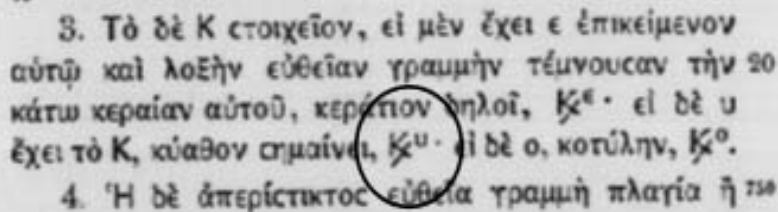


Πρὸς λιθιῶντας φάρμακον ᾧ μαρτυρεῖ Μαρκιανὸς ὁ Ἄφρος ἰατρός. >C>  
 Λαγωῦ δέρμα ἐπιτίθει ἐπὶ κεραμίδος, καὶ εἰσάγαγε εἰς φεῖρον· καὶ ὅταν κατῆ  
 ὡς δύνασθαι λειοῦσθαι καλῶς, λαβὼν καὶ λεάνας, δίδου ἐξ αὐτοῦ Ϝ<sup>υ</sup> μετ' οἴνου νήσει  
 ἐν τῇ ἐμβάσει τοῦ θερμοῦ. Εἰ δὲ βούλει, φησὶ, δοκιμὴν λαβεῖν τοῦ φαρμάκου, βάλε  
 ἐξ αὐτοῦ εἰς οἶνον καὶ ἔμβαλε τῷ οἴνῳ, λίθον ἐκ ποταμοῦ, καὶ σκεπάσας ἕα ἡμέρας

Daremberg, C. & Ruelle, C.É., *Oeuvres de Rufus d'Éphèse* (Imprimerie Nationale, Paris, 1879) 571

### Example 2




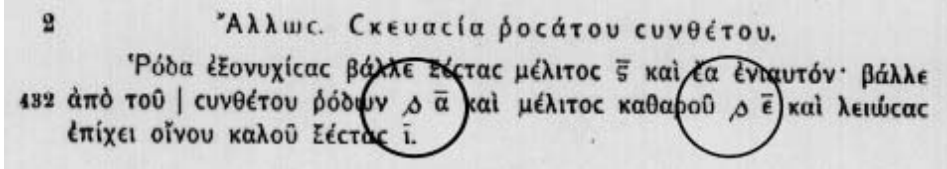
Pseudo-Galenus Med., *De ponderibus et mensuris*. Fragment 52 section 4







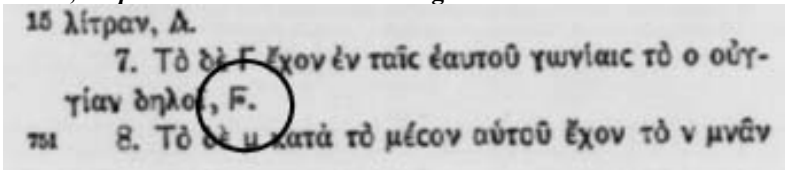
3. Τὸ δὲ Ϝ στοιχεῖον, εἰ μὲν ἔχει ε ἐπικείμενον  
 αὐτῷ καὶ λοξὴν εὐθείαν γραμμὴν τέμνουσαν τὴν 20  
 κάτω κεραιάν αὐτοῦ, κεράτιον ἡλοῖ, Ϝ<sup>ε</sup>· εἰ δὲ υ  
 ἔχει τὸ Ϝ, κύαθον σημαίνει, Ϝ<sup>υ</sup>· εἰ δὲ ο, κοτύλην, Ϝ<sup>ο</sup>.  
 4. Ἡ δὲ ἀπερίστικτος εὐθεία γραμμὴ πλαγία ἢ 720

Hultsch, F., *Metroligatorum scriptorum reliquiae*, vol. 1 (Teubner, Leipzig, 1864) 218

## 12. Greek Litra Sign

<b>Sign</b> 	<b>Similar Unicode</b> See below
<b>Definition and comments</b> This is the base measurement for the Roman weights system. It weighs 327.45g. LSJ <sup>20</sup> also record the word <i>Litra</i> being used for a Sicilian silver coin (later, one third of a standard Roman <i>As</i> ) and for the Italic version of the Kotyle (as a measure of capacity). <sup>21</sup>  The TLG has recorded one glyph variant:  . Bilabel notes <sup>22</sup> a further glyph variant,  . This character occurs with great frequency in the extant sources.	
<b>Example 1</b> <b>Oribasius Med., <i>Collectiones medicae</i> (lib. 1-16, 24-25, 43-50). Book 5 chapter 33 section 2</b>  Raeder, J., <i>Oribasii collectionum medicarum reliquiae</i> , vol. 1 (Teubner, Leipzig, 1928) 152	

## 13. Greek Ounkia Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> This character represents one-twelfth of a Litra on the Roman system, or 27.29g.  This character is formed from the letters 0393 GREEK CAPITAL LETTER GAMMA and 03BF GREEK SMALL LETTER OMICRON.. This character occurs frequently in extant sources.  The TLG has recorded three glyph variants:  ,  and  . Bilabel <sup>23</sup> also records $\sigma'$ , $\gamma^o$ and $\sigma\upsilon\gamma$ . The first glyph is by far the most common.	
<b>Example 1</b> <b>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 52 section 4</b>  Hultsch, F., <i>Metrologicorum scriptorum reliquiae</i> , vol. 1 (Teubner, Leipzig, 1864) 220	






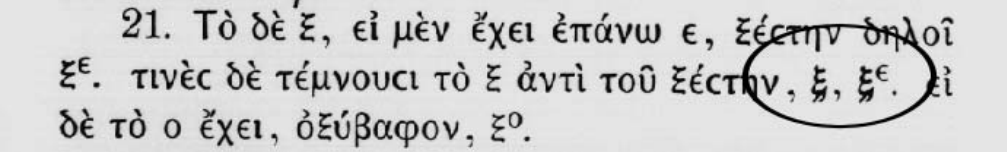
<sup>20</sup> LSJ 1054

<sup>21</sup> See Ancient Greek Measures of Capacity above.









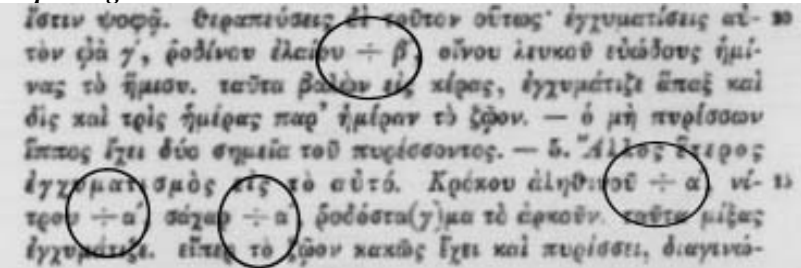
<sup>22</sup> Bilabel (1923) 73

<sup>23</sup> Bilabel (1923) 2307

## 14. Greek Xestes Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> <p>The Greek <i>Xestes</i> is a translation of <i>Sextarius</i> which means sixth part and can refer to either a weight or a measure. However, it is most commonly used to refer to the liquid measure which is approximately 500ml.</p> <p>The TLG records four glyph variants: , , , . Bilabel notes six glyph variants: <math>\xi</math>, <math>\xi</math>, <math>\zeta</math>, <math>\zeta</math>, <math>\zeta</math> and <math>\zeta</math>.<sup>24</sup></p>	
<b>Example 1</b> <p>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 56b section 21</p>  <p>Hultsch, F., <i>Metrologicorum scriptorum reliquiae</i>, vol. 1 (Teubner, Leipzig, 1864) 228</p>	

## 15. Greek Artabe Sign


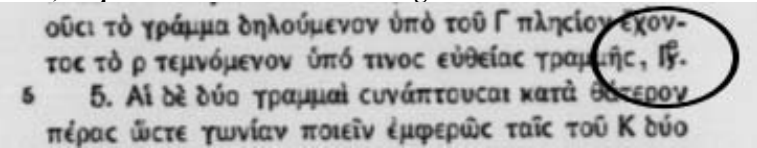
<b>Sign</b> 	<b>Similar Unicode</b> 00F7 is similar to one glyph variant
<b>Definition and comments</b> <p>This is used in both Persian and Egyptian measures systems. In the Persian it represented either one Medimnus or one Medimnus and three Choinikes (see ancient Greek Measures of Capacity above. One Choinix is approximately 1l). In the Egyptian it represented a measure of between 21-42 Choinikes.</p> <p>Kenyon records three glyph variants for the Artabe: , , .<sup>25</sup> However he deems the first two to be rare. Bilabel records 16 glyph variants which, excluding the variants of Kenyon's rare glyphs, are: , ,  and .</p>	
<b>Example 1</b> <p>Hippiatrica, <i>Excerpta Lugdunensia</i>. Section 4</p>  <p>Oder, E. &amp; Hoppe, K., <i>Corpus hippiatricorum Graecorum</i>, vol. 2 (Teubner, Leipzig, 1927) 273</p>	

<sup>24</sup> Bilabel (1923) 2306


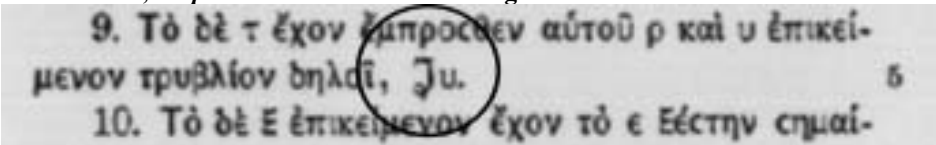
<sup>25</sup> Kenyon (1974) 129



## 16. Greek Gramma Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> <p>The <i>Gramma</i> translates the Roman <i>Scrupulus</i> which is <math>\frac{1}{24}</math> of an <i>Ounkia</i> or 1.137g. This was a standard measure used by doctors.<sup>26</sup></p> <p>This character may be regarded as a joined 0393 GREEK CAPITAL LETTER GAMMA with a superscripted 03A1 GREEK CAPITAL LETTER RHO with a slash half-way down its vertical bar.</p>	
<b>Example 1</b> <b>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 52 section 4</b>  <p>Hultsch, F., <i>Metrologicorum scriptorum reliquia</i>, vol. 1 (Teubner, Leipzig, 1864) 220</p>	

## 17. Greek Tryblion Base Sign

<b>Sign</b> 	<b>Similar Unicode</b>
<b>Definition and comments</b> <p>The <i>Tryblion</i> was a receptacle often used by doctors to measure out prescriptions. As a measure it is exactly one <i>Kotyle</i> (see above). It also functions as a weight where it represents six <i>Drachmas</i>.</p> <p>The symbol for a <i>Tryblion</i> is formed with the character given above followed by 03C5 GREEK SMALL LETTER UPSILON. The character above may be regarded as being formed from a ligature of 03A4 GREEK CAPITAL LETTER TAU with 03C1 GREEK SMALL LETTER RHO. However these characters have been reflected in the y-axis so forming quite a distinct character.<sup>27</sup></p>	
<b>Example 1</b> <b>Pseudo-Galenus Med., <i>De ponderibus et mensuris</i>. Fragment 52 section 9</b>  <p>Hultsch, F., <i>Metrologicorum scriptorum reliquia</i>, vol. 1 (Teubner, Leipzig, 1864) 221</p>	

<sup>26</sup> See Hultsch (1912) 1708

<sup>27</sup> See Radke (1939) 710-11