A. Administrative

1. Title: Proposal to add Greek epigraphical letters to the UCS
2. Requester’s name: Nick Nicholas
3. Requester type: Expert contribution
4. Submission date: 2005–01–01
5. Requester’s reference: —
6a. Completion: This is a complete proposal
6b. More information to be provided? No.

B. Technical—General

1b. Addition of character(s) to existing block? Name? Yes. Greek or Greek Extended.
2. Number of characters in proposal: Six
4. Proposed Level of Implementation (1, 2 or 3) (see Annex K in P&P document): Level 1
   noncombining character
   Is a rationale provided for the choice? No
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 P&P document? Yes
   b. Are the character shapes attached in a legible form suitable for review? Yes
6a. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard? —
6b. If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used: —
7. References:
   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)? Yes
9. Additional Information: See below
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 (for example: National Body, user groups of the script or characters, other experts, etc.)? Yes
   If YES, with whom? Subscribers of Unicode Greek and Epigraphical mailing lists.
   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 and individuals interested in Greek linguistics and epigraphy
   Reference: —

4. The context of use for the proposed characters (type of use; common or rare): Occasional in Greek epigraphy, occasional in Ancient Greek linguistics
   Reference: —

5. Are the proposed characters in current use by the user community? Yes
   If YES, where? Reference: Characters are present in various publications on Ancient Greek linguistics, and in publications of epigraphic corpora

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? Yes
   If YES, is a rationale provided? Contemporary use, keeping character together with other Greek characters
   If YES, reference: —

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? No.

8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? No (but see below)
   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
    If YES, is a rationale for its inclusion provided? Yes
    If YES, reference: —

11. Does the proposal include use of combining characters and/or use of composite sequences? 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: —

Proposal

The characters discussed in this proposals represent distinct letters used in local ancient forms of the Greek alphabet, which would be candidates for inclusion in the UCS. There are arguments for and against their inclusion in the UCS, which I give below. The intent behind this proposal is that the characters should be considered now in order to finalise the Greek script alphabetic repertoire.

Linguists and epigraphers have conflicting requirements with regard to these letters. With the possible exception of tsan, all letters discussed here represent new allophones of existing phonemes in Greek, rather than new phonemes. Alphabets normally encode only phonemes, which is why the kappa was dropped early from the Greek alphabet: the Greek language had no /q/ phoneme distinct from /k/, unlike Phoenecian. Moreover, the dominant form of Ancient Greek used by classicists is Attic Greek, so there is an overwhelming tendency to normalise the letters of inscriptions to Attic phonology and the standard Greek alphabet that represents it, when publishing inscriptions. Such normalisation already takes place in using standard letter forms as opposed to the local (epichoric) forms found regionally. The tendency of epigraphers with these problem letters has been to normalise them as well, making the text readily recognisable from the point of view of Attic Greek. Linguists on the other hand are keen to find evidence of Ancient phonetic change; so in their publication of inscriptions the problematic letters are likelier to be retained as they are.

The variation of epichoric letterforms for the same underlying letter was prodigious in Ancient Greece, but is decidedly outside the scope of Unicode, which encodes letters and not glyphs. For that reason, discussions of the history of the Greek alphabet (such as Jeffery 1990) are not the kind of publication where usage should decide the adoption of distinct codepoints: the glyphs appear there qua glyphs, as illustrations, rather than as distinct codepoints in text. (Jeffery however is rather more conservative than other script historians in her avoidance of epichoric glyphs in her exposition.) The letters considered
here are considered only because they encode distinct phones (if not phonemes), and their conflation with canonical Greek letters is open to question. Their use in normalised transcriptions of Greek inscriptions, published for their text rather than their glyphs, give the strongest support for their adoption—especially if the publication concentrates on their content rather than their language (collections of verse—Hansen 1983, Peek 1955—or of historical documents—Meiggs & Lewis 1969).

In order to trace the tradition of representing these letters in transcription in epigraphy, I concentrate in my examples in one inscription for each letter: the decree of Lygdamis and the Halicarnasseans for sampi (GDI 5531, Ditt. Syll. 45: Example 3–7); the epitaph of Dweinias for Corinthian ei (IG IV.358, GDI 3114: Example 12–17); the Mantinean inscription on Athena Alea for tsan (IG V.ii.262: Example 22–24).

The proposals involve conflation of distinct glyphs, which I argue constitute the same underlying letter (an Ionian and a Pamphylian archaic sampi; a Corinthian and a Boeotian Ei)—or a conflation under the same codepoint of identical glyphs representing distinct letters (Tsan and Pamphylian Digamma). There is no tradition of using capital case for these codepoints, but I am proposing capitals as they are logically possible, and likely to be demanded once the letters are adopted (cf. the addition after the fact of capital versions of lunate sigma, Greek numeric characters, etc.)

1. GREEK LETTER SMALL ARCHAIC SAMPI, GREEK LETTER CAPITAL ARCHAIC SAMPI.

Ionian glyph (suggested as reference glyph):

\[ \text{I} \]

Pamphylian glyph:

\[ \text{T} \]

Capital glyphs: suggest same glyph as for lowercase, appropriately resized from x-height to cap height.

The letter conventionally called sampi (Jeffrey 1990:38–39, 428; http://www.parthia.com/fonts/sampi.htm; Example 1, Example 8) was in use in Ionia between 550 and 450 BC. Jeffery lists the cities of Ephesus, Erythrae, Teos, Halicarnassus, Cyzicus, Pontic Mesambria, Chalcedon, Samos, Massalia, with rare usage also in Attica. The letter was used where conventional Greek orthography used σσ/ or ξ/.

There has been speculation that the letter was originally borrowed from the script of Carian, a language indigenous to Asia Minor. Certain inscriptions, notably the Halicarnassian decree used here as an example, use it only for proper names borrowed from Carian (including Halicarnassus itself), but elsewhere it is also used for native Greek words (e.g. τεταράκοντα = τεσσαράκοντα ‘forty’: Example 2). As a result, there has been speculation that the letter originally represented a sound, such as /ʃ/, which did not exist in Greek. (See also Example 9.)
The square psi-like letter used in the Pamphylian dialect of Greek to represent /s/, /ss/ and /ps/ (Brixhe 1976:7–9; Example 10) has also been identified with sampi (http://www.parthia.com/fonts/sampi.htm). (Note that there is a distinct glyph in the Pamphylian epichoric alphabet that corresponds to psi proper, so this is a letter distinct from psi in Pamphylian.) The identification of the Pamphylian letter with Ionian sampi is not definitive historically: the Pamphylian character could have been an independent loan from Carian, from the Cypriot syllabary, or directly from Semitic scripts. Moreover, the Ionian and Pamphylian glyphs are not identical. But their phonetic value is identical or close to it, and the two variants were in geographical proximity; disunifying them as codepoints serves no defensible purpose. The glyph will need to be specific to the dialect encoded, however, as already occurs for Italic Te in Serbian and Russian.

The letter sampi has been identified as the precursor of the numerical symbol sampi = 900 (U+03E1 GREEK SMALL LETTER SAMPI Ϙ), which it closely resembles, especially in its more archaic form (cf. the reference glyph for U+1034A GOTHIC LETTER NINE HUNDRED ↖). Before that identification was made, the letter was known to 19th century scholarship as disigma, in light of its phonological equivalence to σ. The name sampi is likewise a late descriptive term (‘like a π’, referring to the late glyph); the ancient name of the letter is unknown.¹

Unlike the other epigraphical letters considered here, the sampi routinely appears in published texts as a distinct letter, rather than as normalised ιι or ξ—aided by the suspicion that it represents a distinct phone (Examples 3–7; see also the copious instances reproduced in http://www.parthia.com/fonts/sampi.htm). Often the required glyph has not been available typographically, and the letter is represented with a capital τau in a case-mixing context, which is assumed to disambiguate the letter (τεταράκοντα; e.g. Example 4, Example 8).

The question posed here is therefore whether the archaic sampi should be disunified from the numerical sampi, as has already taken place with Archaic vs. Numerical Koppa (U+03D9, U+03DF), and Digamma vs. Stigma (U+03DD, U+03DB).

If adopted, the archaic sampi should sort with the numerical sampi, just as the archaic koppa sorts with the numerical koppa. A reference glyph should be selected that accentuates the letter’s ‘serifs’, to avoid confusion with capital τau (despite their frequent conflation in heritage data).

There is no tradition of differentiating capital from lowercase archaic sampi, and past usage has given the lowercase letter both x-height (Examples 2, 6) and cap height (Examples 1, 3, 4, 5, 7, 8, 9). I propose that despite the preponderance of cap height and the absence of a casing distinction, the reference glyphs have the lowercase letter at x-height and the capital at cap height.

**Pro**

* There is precedent for such disunification with the other two Greek numerical

¹ A letter used in various locales of Italy has been tentatively identified with sampi recently; but since such texts belong to the Old Italic alphabet, and are published in Latin transcription, this is beyond the scope of a proposal for a Greek codepoint.
letters, koppa and stigma.

- Like the koppa and stigma, the glyph traditions of the numerical and epigraphical sampi have diverged: the numerical sign has never been used to represent the epigraphical letter. (Either capital tau has been used, as an approximation, or a specially drawn letter representing the sampi itself.)
- The identification of the ‘disigma’ with the sampi is conjectural, although unlikely to be challenged in the future.
- If the Pamphylian letter is conflated with the Ionian disigma/sampi, the identification of the two is even more tentative, and is primarily undertaken for practical reasons. This provides more incentive not to identify the Pamphylian letter with the numeric sampi.
- The distinct glyph appears consistently in publications of inscriptions—including Meiggs & Lewis (1969: Example 7), which is a historical rather than a linguistic collection. Unlike the other letters considered here, I am aware of no tradition of transliteration with a normal letter and diacritic, nor of normalisation to σσ or ξ.

Contra

- The numerical character and the epigraphical letter are identified by the same name, and are at least at some level the same character.
- Unlike the koppa, the use of sampi as a letter was regionally restricted, which means the disunified letter would not be widely used.

2. GREEK LETTER SMALL EI, GREEK LETTER CAPITAL EI.

Boeotian glyph (suggested as reference glyph): ⊥

Corinthian glyph: E

Capital glyphs: suggest same glyph as for lowercase, appropriately resized from x-height to cap height.

The phoneme /eː/ which had appeared in Greek by the 5th century BC was normally represented by the digraph ει, since in many instances it was a phonological development of earlier /ei/. A few alphabets however accorded /eː/ a distinct letter. Notably, Corinth used the glyph Β for /e/ and /ɛː/ (standard η), and Ε for /eː/ (Jeffery 1990:114–115). (The same applies for the area around Corinth and its colony Corcyra, with some modifications.)

This period also saw the raising of short vowels, and the tack glyph ⊥ was used briefly in Thespieae of Boeotia, ca. 424 BC, for a raised /e/ before a vowel (Buck 1955:22, Jeffery 1990:89; Méndez Dosuna 2003:86). The use of a sign distinct from epsilon and iota strongly
suggests the phone had an intermediate phonetic value at the time—although elsewhere in Boeotia iota and epsilon iota were used in that context.

In this proposal, I suggest the Boeotian and the Corinthian letters be conflated for convenience, as they are in complementary distribution. Note however that they are not phonetically identical: the Corinthian vowel is long, but the Boeotian is short.

Since ei is a variant of epsilon, it could either sort after epsilon, or collate with the digraph ηι, with which it is identified in its Corinthian usage, and which is also not inconsistent with Boeotian usage.

The name of the character if adopted may need to be altered, since ei (ει) was the original name of the letter known since the Middle Ages as epsilon.

**Pro**

- A distinct glyph is usual in epigraphical publication, and is consistent with the insistence by epigraphers of having the inscription represent the lettering on the stone faithfully, including the letter count.
- A distinct letter is called for in the citation of these forms in Ancient Greek linguistics, as it constitutes important evidence for the monophthongisation of /ei/ and for vowel raising. For that reason, the glyphs remain in use; cf. the Boeotian letter appearing in Méndez Dosuna (2003:86), available as of this writing as a PDF.

**Contra**

- The Corinthian glyph is identical to capital epsilon. Epigraphical publications rely on the ill-formedness in Greek orthography of case mixing (Examples 13, 14) to use a capital epsilon in a lowercase or titlecase context: ΔϝιΕινιας /dwe:nias/. As a general solution in the UCS, this is impractical. Some attempts have been made at using typographic style to differentiate epsilon from Corinthian Ei, but they do not seem promising (Example 11, Example 20). The same problem obtains for the Boeotian glyph, which is identical to the “tack” reference glyph of heta proposed separately.
- The Corinthian glyph is problematic enough that Greek epigraphers themselves do not consistently use it. Jeffery (Example 17) uses the digraph without further annotation for Corinth, and considers both the Boeotian and Corinthian letters glyph variants of epsilon in her discussion, rather than distinct letters. Peek is content to collate ei with lowercase epsilon (Example 15), while Hansen (Example 16) uses a ligature tie ηι in his transliteration, indicating his own dissatisfaction with the Е glyph. Similary mistrust is evident with the Boeotian letter. Schwzyer (Example 18) transliterates it as <έ>, though this is consistent with his avoidance of tsan in favour of <έ> (Example 22; see below).

Jeffery’s exposition is on the history of the alphabet rather than linguistics, which is why she can afford to regard the Boeotian glyph as a variant of epsilon; Buck needs to recover phonetic detail, so he preserves the glyph as a distinct phone (see introductory comment). Thus, Jeffery (1990:402) transliterates ФΙΣΟΚΛΙΕΣ as Фίοκλεϊες and in the authoritative *Inscriptiones Graecae* series, inscriptions from Thespiae have ι printed as і—though with an
extensive accompanying note on the likely phonetics involved, and a facsimile of the original inscription. But Buck (1955:22), who only cites the Thespian forms to illustrate their phonetics, cites such a form as (ΠΟΛΥΚΛΕΣ) ΠΟΛΥΚΛΕΣ = ΠΟΛΥΚΛΕΣ (with semi-normalised inscription form, normalised inscription form, and Attic equivalent). (Example 21; Note the acute on the EI.)

Failing adoption of a distinct codepoint for EI, both the Boeotian and Corinthian glyph could be encoded as ligatures of an underlying ει. This would not be problematic for Corinth, since EI there represents the same phoneme as ει elsewhere, and is so normalised outside of epigraphy (and often within it). In Boeotia, ε, ι, ει and ι appear in free variation, with the ultimate phonetic identity the usual spelling. One could encode ι as a glyph variant of ε or ει, though at the risk of losing phonetic detail; this distinction would need to be supplied at a higher level of markup.

Boeotian EI could be conflated with “tack” heta as the same codepoint. Boeotian had a heta of its own, but since print sources have had to deal with the identity already this is not necessarily a problem: a Boeotian ΗΟ θιος /ho θiōs/ ‘the god’ would be encoded as either ho θi-ς or iho θεως, though in the latter instance some sort of diacritic on the epsilon might be necessary. (Jeffery, who uses i = /h/, ignores the distinction as seen.) Alternatively one might recommend that epigraphers henceforth encode Boeotian EI as epsilon with a diacritic (e.g. U+031D COMBINING UP TACK BELOW, from the IPA), with a glyph ligature producing ι for display, but allowing /h/ and /e/ to be underlingly distinguished.

As with the archaic sampi, there is no tradition of casing the ει (although the ‘tack’ glyph for heta, which is identical to the Boeotian glyph, is capitalised by Jeffery). In fact, since capital Е is routinely used to encode lowercase (Corinthian) EI (except for Example 19), such tradition as is currently extant for the glyph is that it appear as cap-height, not x-height; the same appears to hold for the Boeotian glyph. Nonetheless, I suggest that the reference glyph make an x-height/cap-height distinction.

3. GREEK LETTER SMALL TSAN OR PAMPHYLIAN DIGAMMA, GREEK LETTER CAPITAL TSAN OR PAMPHYLIAN DIGAMMA

Glyph for Tsan or Pamphylian Digamma: /modal donate/  

Capital glyph: suggest same glyph as for lowercase, appropriately resized from x-height to cap height.

I propose that this codepoint be used to encode two epichoric letters of Greek which have distinct phonetic realisations, histories, and regional provenances—but which use an identical glyph: the Arcadian tsan, and the Pamphylian digamma. Below, I describe the letters separately, before making the case for treating them as the same codepoint.

3.1. Tsan

The use of this letter is restricted to a single inscription from Mantinea in Arcadia (Jeffery
1990:40, 212–214), where it probably represents a development of san, in turn a
development from Phoenecian tsade. (The name Tsan is my own invention.) The letter is
significant in Greek historical linguistics because it represents the evolution of fronted
proto-Greek *kʷ > ts, a “missing link” in the evolution of *kʷ to /ss/ (/tt/ in Attic).
Since tsan does not appear on any abecedaries (alphabet inscriptions), its sorting order is
unknown. Jeffery sorts it with sigma, of which she considers it a variant; but if tsan is
regarded as related to san, it should be placed together with it. If on the other hand tsan is
regarded as a whole-cloth innovation, it should be placed at the end of the Greek alphabet.

Pro

• The letter represents a distinct phonological development in Greek, which is
  significant in Greek linguistics (Example 25).

• A conflation with san is not certain historically (Jeffery 1990:213), and tsan may
  be a local invention; so treating tsan as a glyph variant of san would be an
  insecure conjecture.

Contra

• Notwithstanding its historical importance, tsan appears in only one inscription,
  which makes it very much an idiosyncratic letter—not the type normally
  adopted in the UCS.

• The tsan appears from a period and region of appreciable innovation in the
  alphabet: Mantinea also presents innovated forms of epsilon, mu, and psi. Such
  innovation further emphasises the idiosyncratic nature of the letter.

• Unlike archaic sampi, tsan does not appear in published transcriptions of the
  Mantinea inscription: scholars prefer <ś> (Example 22) or <ď> (Examples 23–24).

• While treating tsan as a variant of san would be doubtful historically, it would
  be convenient, since san is not otherwise attested in Arcadia (Jeffery 1990:206).
  Note also that san is not normally used in transcriptions of inscriptions at all, as
  it was mutually exclusive with sigma in Ancient Greek alphabets: it is always
  transcribed as sigma, and its printed use is restricted to discussions of the script
  itself. So san is likely to be underused in any case.

3.2. Pamphylian digamma

The alphabet of the deviant Greek dialect of Pamphylia (Brixhe 1976:5–6) used three glyphs
to represent /w/: digamma, beta, and the glyph Ι. The latter glyph also appears where
Greek would normally have a beta; and a similar glyph appears as a form of digamma or
beta in other epichoric alphabets (Crete, Melos; Jeffery 1990:308). Brixhe (1976:6) concludes
that the glyph Ι is a local development from Phoenecian waw, while the standard digamma
was later imported from other Greek alphabets. (For this reason, he notes, Ι is unrelated
to tsan, which developed from tsade.)

Brixhe (1976:46–57) discusses the distribution of Ι and F, and finds that in early inscriptions
Ι appears after vowels—either in diphthongs ([aw, ew]), or in glides near back vowels
([baluwau])—while the digamma appears elsewhere. He concludes that the importing
of the normal digamma to be used alongside the local form was motivated by a phonetic split,
whereby /w/ gained the allophone [v], represented by F, while И was kept for [w]. (This is well illustrated by Example 29, which Brixhe transliterates into French accordingly.) That said, the distribution of the indigenous and imported digamma was inconsistent even in the earliest surviving inscriptions—e.g. И remained used in [v] contexts in archaic spellings like ИανάЯ/α /wanassa/ [vanassa] ‘queen’, referring to the goddess Artemis. And as far as we can tell, [v] was only an allophone of /w/ (as well as of /b/), and not a distinct phoneme—so that normally it would not be accorded its own letter in an alphabet.

As a result, on the one hand, publications of Pamphylian texts keep the normal digamma and the indigenous digamma distinct, and do not normalise И to the more common F. On the other hand, И and F are treated as the same underlying letter where normalisation is appropriate.

- Panayotou (2001:318) cites the inscription ИανάЯ/α Пρέйя Клэ́мнας Λγά́ραμος Иασиргδας ἄνέθεκε : ἐπίστασι, which she translates into Modern Greek as Στην Ἀνασα της Πέργης ο Κλεμύτας, ο γιος του Λγάραμου, ο Γασιράμως, ἄνεθες; “to the Queen of Perga [i.e. the goddess Artemis], Klemytas, son of Lwaramos, a Wasirwotas, raised this (?)”. While Panayotou admits she does not know what Wasirwotas means, she does normalise the Pamphylian digamma into the normal digamma in the translation, even though both digammas are used in the same word. Digamma is not a letter of Modern Greek, but the normalisation is motivated. Head (1911) also appends normalised transliterations with standard digamma to cited forms with Pamphylian digamma; e.g. “ΙΑΝΑΤΑΣ ΠΡΕΙΙΑΣ (Γάνασας Περγαίας) Artemis huntress holding wreath and sceptre.” (Head 1911:702).
- The index of Brixhe’s grammar of Pamphylian (1976) treats И and F as the same letter (Example 30).

Pro

- Pamphylian digamma has a tradition of being represented and transliterated as a distinct letter; this is consistent with the epigraphical practice of maximal faithfulness to the inscription as it appears on the stone. (Head 1911:699–705, scanned in as http://www.snible.org/coins/hn/pamphylia.html , employs the Pamphylian digamma as a distinct letter, though the html version substitutes ~ as the Pamphylian digamma glyph is unavailable.)
- The phonetic identity of the Pamphylian digamma is uncertain, and the distinction between the two digammas represents a phonetic innovation,

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2. Buck (1955:47) concludes that the И glyph represents the early development of a [v] pronunciation for /b/ and /w/, and recommends that it “is best transcribed as v (w in German publications).” He thus gets the phonetic value of И wrong, according to Brixhe: it was F, not И, that was pronounced [v]. But since F as /w/ was a widespread feature of Greek alphabets, and И was not, it was expedient to assign И the ‘odd’ transcription, <v>.
3. Note the use of Y for the letter here proposed to be encoded as Archaic Sampi.
4. The html version cited has conflated archaic sampi and tau.
important in the history of Greek.

- The distribution of the two digammas is at no stage wholly predictable, so the alternation between the two glyphs could not be automated.
- The distinction is retained not only in publication of Pamphylian inscriptions, but also in discussion of Pamphylian grammar (Example 28), where normalisation is usual. (But contrast Examples 26–27, by a different author, where normalisation to a Latin transliteration is preferred for linguistic discussion.)

Contra

- If both tsan and Pamphylian digamma were adopted, they would end up having the same reference glyph. (See below.)
- The Cretan and Melian instances of the letter have always been treated as glyph variants of digamma and beta respectively, so the distinct letter should not be used there.
- Even in the case of Pamphylia, there was some degree of interchangeability between the two digammas, and they clearly represented the same underlying phoeneme; in at least some contexts (collation, translation to Attic or Modern Greek), the Pamphylian is normalised to the standard digamma.
- Consistent with his recommendation, Buck (Example 26) cites [selúwijus] as ΣΕΛΟΙΟΣ when discussing the Pamphylian glyph; but when citing the form linguistically, in the context of glides in Greek in general, he gives it as the normalised ΣΕΛΟΙΟΣ (Example 27), with a Latin v.
- The numismatic font developer Edward (Chris) Hopkins treats the Pamphylian digamma explicitly as a glyph variant of digamma (http://www.parthia.com/fonts/letterforms_usage.htm).

3.3. Conflation of Tsan and Pamphylian digamma

The case for tsan and Pamphylian digamma as codepoints in the UCS can be made individually; but it would be untenable to have in the UCS two separate codepoints in the same script with exactly the same glyph. For that reason, it is expedient to conflate the two letters in the one codepoint, despite their distinct histories and pronunciation. No single ancient text will contain both letters, because of their different regional provenance. A collection of texts or secondary work on Greek might give rise to confusion with the one codepoint being used for the two letters; but that is no more confusion than is already in place in print, with the identical glyphs. Text processing seeking to distinguish between the two phonetic values would need to resort to higher-level markup; but that is no more than already is the case with Latin letters having distinct phonetic values or properties in different languages. It is unusual for this duplication to take part in the Greek script, which is conventionally associated only with Attic and Modern Greek phonology; but the resulting inconvenience is not argument enough to justify two identical reference glyphs.

If the two letters are conflated, the resulting codepoint should take on the properties of the most prevalent letter, which is clearly the Pamphylian digamma. For instance, the default sorting location of the letter should be with normal digamma; if Arcadian instances need to
be sorted with, say, san, this would be a matter of introducing an Arcadian-specific sorting order, and possibly having words sort in two different locations depending on language markup. (The situation would be akin to a single index containing Swedish and German words with <ö>, the German instances sorting after <o>, and the Swedish after <z>.)

The usage to date of tsan and Pamphylian digamma glyphs has had cap-height for lowercase glyphs, and no capital/lowercase distinction. (The transliterations of the letters with sigma–macron–below and normal digamma, on the other hand, use the normal lowercase letters, and indicate that casing is underlyingly there.) Again, in anticipation of future likely requests for such a casing distinction to be made, I recommend that the reference glyphs be at x-height and cap-height for the lowercase and capital codepoints.

**Examples**

**Fig. 25**

Example 1. History of the shapes of sampi (Jeffery 1990:38). Fig. 1 is the letter sampi/disigma; figs. 2–4 are the numeral sign sampi, with which the letter has been identified.


Example 3. Lygdamis inscription (Roberts 1887:174).
Example 4. Lygdamis inscription (Schwyzer 1923:360). Sampi rendered as mixed-case capital tau.

Example 5. Lygdamis inscription (Solmsen & Fraenkel 1930:107).


4. The four Phoenician signs for sibilation were taken over, but with varying distribution or values. Both the ς or ε (sigma) and m (san) were used for σ, but, with few exceptions (e.g., once m beside ε in the Locrian no. 59), only one or the other at the same place and time. A sign m, a simplified form of m is used in an Arcadian inscription for a sibilant of special origin, as μες = τίς, Cypr. σα (no. 17; see 68.3); ττ, occurring also in the Carian alphabet and perhaps ultimately another modification of the san, is used for usual σα = Αττ. ττ at Halicarnassus (Ἀλικαρνασσός) beside Ἀλικαρνασσόσιον), Teos (Θρακ. ττ beside θάλασσαν), Ephesus (ττΙφρες, etc.) and elsewhere (see p. 348). This is the source of the numeral sign for 900, namely γ, known by the late name “sampi” (σάν πί ‘like πι’, from its form).


(ς) ττ/σσ

It has already been mentioned (pp. 10ff.) that Attic in a number of words shows ττ where most other dialects have σσ—e.g. μέλττης, ἐλάττων, τέτταρες. In these forms the double consonants in question derive from original τύ, λύ and τέ respectively, which might have been expected in the first instance to give rise to some kind of affixative stage such as [τς] or [τ] (as in catch or cats). This stage is probably represented by some early Asiatic Ionic inscriptions which show in such cases a special letter Τ (e.g. 6–5 c. B.C. ἔλαΤός, τέΤαρας). This may be derived from the Semitic ’tsade’ (and perhaps

Example 10. Instance of Pamphylian sampi in print, here assumed to have the phonetic value [s] (Brixhe 1976:234).

Example 12. Dweinias epitaph (Roberts 1887:119). Consistent with his practice elsewhere, the transcription Roberts provides is fully normalised, and so employs the epsilon-iota digraph.


Example 15. Dweinias epitaph (Peek 1955:21). Peek, a literary rather than linguistic collection, does not bother to differentiate ei from epsilon at all.

Example 16. Dweinias epitaph (Hansen 1983:72). Hansen uses a ligature tie to mark the ei digraph as a single letter— notwithstanding that Hansen’s, like Peek’s, is a literary rather than linguistic collection.

Example 17. Dweinias epitaph (Jeffery 1990:404). Unlike her usual punctiliousness as a historian of the Greek script, Jeffery is quite happy to transcribe ei as a digraph.
Example 18. Thespian inscriptions (Schwyzer 1923:241). Boeotian ei is transliterated as <é>, with the transliteration noted in the apparatus; the Roman acute forces the suppression of the Greek acute that would normally appear on Ἀρξικλ...'ς.

5. In Boeotian, a compromise between E and I, is sometimes used for the close e, later i (9.4). At Corinth with Corcyra, Sicyon, Cleonae, and Megara there were two characters for the s-sounds, namely, Corinth. e, Sicyon, Ξ = ε or η, but <β> or (Corcyr.) <ε> = original ε or secondary η (but β in an archaic Meg. inscription = ε only, not η, and at Cleonae = η only. Cf. nos. 91-97.

Example 19. Discussion of Boeotian and Corinthian Ei (Buck 1955:18). The Corinthian glyphs are erroneously given as <B> for both /e/, /ɛ:/ and /eː/.
Example 20. Use of capital epsilon (in distinct font) to represent Corinthian Ei (Buck 1955:31).

Boeotian. The spelling is usually ι, but sometimes ε, ιε, or ι (see 4.5), as ιθός, ιθός = θός, ινέθους, ινέθους, beside ινέθους.


Example 23. Mantinea inscription (Solmsen & Fraenkel 1930:8). Tsan transcribed as ς (with the choice of transcription noted in the apparatus).


Example 25. Tsan appears untransliterated in context of linguistic discussion (Bubeník 1983:22).

b. Pamphylian has ḃ in some words (Threra, etc.), but in others a
glyph Ṣ (e.g. Μουσοιος = *οσοιος), which is used also for β (e.g.,
Σιθεσταί), and for υ in the υφ, υθ diphthongs (e.g., Ἴθερα) and the
glide (e.g. Σιλευσ). A similar sign occurs in the Cretan towns of
Eleutherna and Vaxis with the value of ḃ, and at Selinus and Melos
for ἶ. It presumably represented a fricative pronunciation like that of
English ν and so is best transcribed as ν (w in German publications).
Also once φικτή = φικτή.

Example 27. Pamphylian digamma cited in phonetic discussion, transliterated as <v> (Buck 1955:49).

Nominitif

-έως, cf. Κασας (n° 87, 115), Ορονεύς (n° 86)*, Ορονεύς (n° 80, 123); ou -έος (avec ι
notant le second élément de la diphtongue)†, cf. [Κασαιθ] (n° 57). Contrairement à

Example 28. Pamphylian digamma used in discussion of Pamphylian nominal morphology
(Brixhe 1976:111).

Μιακλῆς
Μιακλῆς
Μηχαλις
Ἀπεκασματω[ς]
Κοραλίνη
Κοραλίνη

Épitaphe de Miaklis, fils de Varnis, de Meaklis, fils d’Apélaouwís, et de Korvalina, fille de
Varnis.

Example 29. Pamphylian inscription (Brixhe 1976:232). Note that in his translation of the
proper names, Brixhe uses <w> for the Pamphylian digamma, and <v> for the normal
digamma, consistent with his theory of how they had been pronounced.
Example 30. Index of proper names (Brixhe 1976:304). Pamphyan and normal digamma are collated as the same letter.

Properties

UCD Entry

```
aaaa;GREEK SMALL LETTER ARCHAIC SAMPI;Ll;0;L;;;;;N;;;;bbbbb;
bbbbb;GREEK CAPITAL LETTER ARCHAIC SAMPI;Lu;0;L;;;;;N;;;;aaaa;
ccccc;GREEK SMALL LETTER EI;Ll;0;L;;;;;N;;;;ddddd;
ddddd;GREEK CAPITAL LETTER EI;Lu;0;L;;;;;N;;;;ccccc;
eee;GREEK SMALL LETTER TSAN OR PAMPHYLIAN DIGAMMA;Ll;0;L;;;;;N;;;;ffff;
ffff;GREEK CAPITAL LETTER TSAN OR PAMPHYLIAN DIGAMMA;Lu;0;L;;;;;N;;;;eeee;
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DUCET Entry

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03E1 ; [.110A.0020.0002.03E1] # GREEK SMALL LETTER SAMPI
03E0 ; [.110A.0020.0008.03E0] # GREEK LETTER SAMPI # same distinction made between Koppa and Archaic Koppa
aaaa ; [.110B.0020.0002.03E1] # GREEK SMALL LETTER ARCHAIC SAMPI
bobb ; [.110B.0020.0008.03E0] # GREEK CAPITAL LETTER ARCHAIC SAMPI # same distinction made between Koppa and Archaic Koppa
03F8 ; [.110C.0020.0002.03F8] # GREEK SMALL LETTER SHO
03F7 ; [.110C.0020.0008.03F7] # GREEK CAPITAL LETTER SHO
ccccc ; [.10ED.0020.0002.03B5][.10F3.0020.0002.03B9] # GREEK SMALL
LETTER EI

ddd  ; [.10ED.0020.0008.0395][.10F3.0020.0008.0399] # GREEK CAPITAL LETTER EI # that is, by default collate EI (both Corinthian and Boeotian) as underlyingly epsilon-iota

03DD  ; [.10EE.0020.0002.03DD] # GREEK SMALL LETTER DIGAMMA

eeee  ; [.10EE.0020.0002.eeee] # GREEK SMALL LETTER TSAN OR PAMPHYLIAN DIGAMMA

03DC  ; [.10EE.0020.0008.03DC] # GREEK LETTER DIGAMMA

ffff  ; [.10EE.0020.0008.ffff] # GREEK LETTER TSAN OR PAMPHYLIAN DIGAMMA

03DB  ; [.10EF.0020.0002.03DB] # GREEK SMALL LETTER STIGMA

03DA  ; [.10EF.0020.0008.03DA] # GREEK LETTER STIGMA

References


