Byzantine Musical Notation: Proposal for Changes

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For supporting documentation for the proposals here presented, see Unicode Technical Note #20, which I have authored.

At this stage, I have identified several neumes I believe should be added to the Byzantine musical notation repertoire; but without any feedback from experts, I am not prepared to propose them for encoding now. My investigation strongly suggests, however, that a supplementary Byzantine Musical Notation block of at least another 64 codepoints will prove necessary. Early notation, especially with its kontakarian variant, will likely provide a substantial number of additional codepoints, although musicological research is likely still at too preliminary a stage to allow for a normalised repertoire.

I already believe the following additions to be necessary ultimately; they are alluded to in the technical note:

1. Annotations

I propose the following explanatory annotations be added to the Byzantine Musical Notation code charts. Given the impracticality of deprecating codepoints at this stage, I address codepoints I believe should not have been adopted by compatibility rather than canonical decomposition; I discuss them separately, however.

1.1. Deprecated

1D000 Byzantine Musical Symbol Psili
   ≈ 0313 [Combining Comma Above]

1D001 Byzantine Musical Symbol Daseia
   ≈ 0314 [Combining Reversed Comma Above]

1D002 Byzantine Musical Symbol Perispomeni
   ≈ 0342 [Combining Greek Perispomeni]

The Alexandrian ‘Prosodic’ system, referred to in the Byzantine Musical Notation rubric, introduced diacritics into Greek: it was used to indicate Classical Greek pitch accent (acute, grave, circumflex), vowel length (breve, macron), the presence of initial ō (smooth
and rough breathing), and the position of word-breaks (hyphen, hypodiastole). The Alexandrian system has obviously influenced the development of Byzantine musical notation; from the ephotonetic period on, the musical use of Acute and Grave (1D003, 1D048; 1D005, 1D058) was distinct from their textual use as 0301 0300, and their disunification can be defended. I am not aware of any musical usage for the psili, daseia, and perispomeni, however. Indeed, for the psili and daseia (the absence or presence of an initial \( h \)-), it is hard to conceive of such usage. I believe the signs have been copied across uncritically into the Byzantine Musical Notation block because they were part of the Alexandrian system; but that does not make them distinct musical signs.

1.2. Equivalences

Although it is too late to do anything about it now, several of the codepoints allocated in the Byzantine Musical Notation block are redundant.

1.2.1. Diachronic equivalents

Several pairs belong to the Early and Post-Early systems respectively, but have the same basic functions, if not necessarily the same exact glyphs. I propose these be cross-referenced, with the early glyphs referring to the more widely used post-early glyphs (which are in current liturgical use). Note that these have typically been differentiated in the character names by the adjectives archaion ‘ancient’ and neo ‘modern’.

1. The other codepoints in the Letters rubric are note initials used in signatures. Though they are stylised versions of letters, their usage is musical and not textual, and there is no reason to conflate them with the normal textual letters.
The two signs appear to have been interchangable in Middle notation; the names—which are merely the feminine and neuter form—were already interchangable in Early notation.

1D07F is the ‘Above’ glyph. The ‘Below’ equivalent 1D0F4 is a presentation variant, as discussed below.

These signs are semantically identical though their names and glyphs are different, the yporroi being the newer symbol and the katavasma the older.
1.2.2. Specials

The following signs are explicitly intended as presentation variants of the same sign: they have the same shape and meaning, and differ only in the position of the sign, in accordance with the traditional combinatorics of the signs. The position of the sign is conditioned only syntactically, and there is no semantic distinction made. The positions of the signs are mentioned in the codepoint names: ano ‘above’, meso ‘middle’, kato ‘below’. These signs should have been made canonically equivalent; failing that they should be compatibility-equivalent. For convenience, the sign above is taken as the reference sign.

\begin{verbatim}
1D0F0 Byzantine Musical Symbol Kentimata Neo Meso
≈ 1D04E Byzantine Musical Symbol Kentimata Neo Ano
1D0F1 Byzantine Musical Symbol Kentima Neo Meso
≈ 1D04F Byzantine Musical Symbol Kentima Neo Ano
1D0F2 Byzantine Musical Symbol Kentimata Neo Kato
≈ 1D04E Byzantine Musical Symbol Kentimata Neo Ano
1D0F3 Byzantine Musical Symbol Kentima Neo Kato
≈ 1D04F Byzantine Musical Symbol Kentima Neo Ano
1D0F4 Byzantine Musical Symbol Klasma Kato
≈ 1D07F Byzantine Musical Symbol Klasma Ano
1D0F5 Byzantine Musical Symbol Gorgon Neo Kato
≈ 1D08F Byzantine Musical Symbol Gorgon Neo Ano
\end{verbatim}

The flexible positioning of these particular signs does not differentiate them from any number of other Byzantine neumes: all vocal signs can appear above one another, and any system rendering Byzantine notation has to be flexible about the relative placement of neumes.

1.2.3. Mode Signatures

The Proto-Varys and Plagal IV signatures, are clearly compound and analysable in terms of constituent neumes. This should be annotated through compatibility decomposition:

\begin{verbatim}
1D0B2 Byzantine Musical Symbol Martyria Protovarys Ichos
≈ U+1D0B1 U+1D0A3 U+1D0AD [Byzantine Musical Symbol Martyria Varys Ichos + Byzantine Musical Symbol Martyria Alli Protos Ichos + Byzantine Musical Symbol Apostrofoi Telous Ichimatos]
1D0B3 Byzantine Musical Symbol Martyria Plagios Tertartos Ichos
≈ U+1D0AB U+1D0A8 U+1D0AD [Byzantine Musical Symbol Martyria Plagios Ichos + Byzantine Musical Symbol Martyria Tertartos Ichos + Byzantine Musical Symbol Apostrofoi Telous Ichimatos]
\end{verbatim}

I do not suggest that the signature formants (neume remnants: \texttt{U+1D0AC -- U+1D0B1}) be conflated with the neumes that they originated in. The glyph variation of \texttt{1D0A6}, the Mode III signature, likewise argues against its obvious decomposition into \texttt{0393 1D0AF}
1D0B0, since some variants exclude the dipli.

1.2.4. Gorthmic nus

The gorthmic nus, used to notate extratextual/melismatic inserted /n/, are specific to musical notation. Nonetheless they are textual and not musical signs, even if the words they spell out are nonsensical, and they are clearly contextual variants of the Greek letter nu (with which they are often replaced where the gorthmic glyphs are unavailable). Although this context is not recoverable in plain text (it involves the distinction between text proper and intonation formulas), the gorthmic nus should have a compatibility decomposition to the normal Greek letter nu, with their conditioning annotated

\[ \text{Byzantine Musical Symbol Gorthmikon N Aploun} \]
\[ \approx \text{U+03BD [Greek Small Letter Nu]} \]
- Used in intonation formulas instead of nu, before phonemes a, i, o, u

\[ \text{Byzantine Musical Symbol Gorthmikon N Diploun} \]
\[ \approx \text{U+03BD [Greek Small Letter Nu]} \]
- Used in intonation formulas instead of nu, before phoneme e

U+1D0B4 occurs as a reduplication in U+1D0A7 Byzantine Musical Symbol Matryria Trifonias because historically this sign is the old spelling out of the intonation formula vava, using two gorthmic single nus. 1D0B4 could therefore be decomposed to 1D0A7 1D0A7; but I do not believe that would be useful, given the different contexts of use of the two signs, and that decomposing the gorthmic nu to normal textual nu would be preferable overall.

1.2.5. Retard Combinations

The current code chart treats several combinations of retards or quickeners and other neumes as precombined. These combinations do not exhaust all possibilities found in use—particularly for quickeners, where some interpretations of the notation use the dipli as well as the apli. The combinations should have compatibility decompositions to their decomposed equivalents where practical, which will encourage implementers to think of retard dots in combining terms. In the case of quickeners, the relative positioning of the retard and quickener is a matter for higher level markup, but the compatibility marking is still appropriate.

\[ \text{Byzantine Musical Symbol Leimma Enos Chronou} \]
\[ \approx \text{1D058 1D085 [Byzantine Musical Symbol Vareia Neo + Byzantine Musical Symbol Apli]} \]

\[ \text{Byzantine Musical Symbol Leimma Dyo Chronon} \]
\[ \approx \text{1D058 1D086 [Byzantine Musical Symbol Vareia Neo + Byzantine Musical Symbol Dipli]} \]

\[ \text{Byzantine Musical Symbol Leimma Trion Chronon} \]
\[ \approx \text{1D058 1D087 [Byzantine Musical Symbol Vareia Neo + Byzantine Musical Symbol Tripli]} \]

\[ \text{Byzantine Musical Symbol Leimma Tessaron Chronon} \]
\[ \approx \text{1D058 1D088 [Byzantine Musical Symbol Vareia Neo + Byzantine Musical Symbol} \]
1.2.6. Western borrowings

Borrowings into the Modern system from Western musical notation should be so cross-referenced:

1D07C Byzantine Musical Symbol Yfen Kato
≈ 1D175 Musical Symbol Begin Slur, 1D176 Musical Symbol End Slur
1.2.7. Other

There is clearly no semantic distinction between the Diastoli Mikri and the Diastoli Megali; the two should therefore be conflated (and cross-referenced to the Western equivalent Single Barline), notwithstanding the distributional differentiation that seems to be used by Efthymiadis (Figure AA21 in technical note).

1D0DA Byzantine Musical Symbol Diastoli Mikri
≈ 1D0DB Byzantine Musical Symbol Diastoli Megali
→ 1D100 Musical Symbol Single Barline

1D0DB Byzantine Musical Symbol Diastoli Megali
→ 1D100 Musical Symbol Single Barline

The conduits in Greek practice (U+1D09A – U+1D0A0) are composed from chi (from χρόνος, ‘time’) and a quickener or retard. Rumanian (and possibly South Slavic) practice is to indicate tempo with a letter other than chi: Rumanian uses T for timp. The currently encoded conduits reflect only Greek practice, and an informative note should be inserted to that effect.

1D09A Byzantine Musical Symbol Agogi Poli Argi
  • Glyphs shown for conduits reflects Greek practice, with chi as the base letter; different national traditions use glyphs with different base letters (e.g. T in Romanian)

1.3. Variant names

The imidiargon and diargon are called by some authorities diargon and triargon respectively; this should be annotated.

1D098 Byzantine Musical Symbol Imidiargon
  • Called by some authorities Diargon

1D099 Byzantine Musical Symbol Diargon
  • Called by some authorities Triargon

2. Rubrics

In the code chart, the rubrics from Fthores ‘Destroyers’ up to Grammata ‘Letters’ are out by one codepoint; this needs to be changed:

U+1D0B5 Byzantine Musical Symbol Gorthmikon N Diploun belongs to Ichimas and Evidentials, not Destroyers.

U+1D0CA Byzantine Musical Symbol Chroa Spathi belongs to Destroyers, not Differentiators.

U+1D0D9 Byzantine Musical Symbol Geniki Yfesis belongs to Differentiators, not Rhythmics.

U+1D0E5 Byzantine Musical Symbol Simansis Arseos Tetrasimou
belongs to Rhythmics, not Letters.

3. Glyph errors

The reference glyphs of \texttt{1D09C} and \texttt{1D09F}, the Agogi Argi and Agogi Gorgi (Slow Conduit, Fast Conduit) need to be swapped, as should be clear from inspection.

4. DUCET revision

I propose that the equivalences I have identified here be incorporated into DUCET, with full equivalents distinguished at the tertiary level, and compatibility equivalents at the secondary level (excluding the retard combinations):

\begin{verbatim}
1D000 : [*0217.0020.0002.1D000] # BYZANTINE MUSICAL SYMBOL PSILI: made equivalent to 1FBF GREEK PSILI
1D001 : [*0218.0020.0002.1D001] # BYZANTINE MUSICAL SYMBOL DASEIA: made equivalent to 1FFE GREEK DASIA
1D002 : [*021D.0020.0002.1D002] # BYZANTINE MUSICAL SYMBOL PERISPOMENI: made equivalent to 1FC0 GREEK PERISPOMENI
1D006 : [*03EA.0020.0002.1D006] # BYZANTINE MUSICAL SYMBOL DIGRAMMA GG: made equivalent to 03B3 GREEK SMALL LETTER GAMMA + 03B3 GREEK SMALL LETTER GAMMA
1D007 : [*03FB.0020.0002.1D007] # BYZANTINE MUSICAL SYMBOL DIFTOGGOS OU: made equivalent to 03BF GREEK SMALL LETTER OMEGA + 03C5 GREEK SMALL LETTER UPSILON
1D008 : [*03E2.0020.0002.1D008] # BYZANTINE MUSICAL SYMBOL STIGMA: made equivalent to 03C3 GREEK SMALL LETTER SIGMA + 03C4 GREEK SMALL LETTER TAU
1D015 : [*0C23.0020.0002.1D015] # BYZANTINE MUSICAL SYMBOL OLIGON ARCHAION
1D047 : [*0C23.0021.0002.1D047] # BYZANTINE MUSICAL SYMBOL OLIGON NEO: made equivalent to 1D015
1D016 : [*0C24.0020.0002.1D016] # BYZANTINE MUSICAL SYMBOL GORGON ARCHAION
1D08F : [*0C24.0021.0002.1D08F] # BYZANTINE MUSICAL SYMBOL GORGON NEO ANO: made equivalent to 1D016
1D0F5 : [*0C24.0021.0003.1D0F5] # BYZANTINE MUSICAL SYMBOL GORGON NEO KATO: made equivalent to 1D08F
1D018 : [*0C26.0020.0002.1D018] # BYZANTINE MUSICAL SYMBOL CHAMILON
1D056 : [*0C26.0021.0002.1D056] # BYZANTINE MUSICAL SYMBOL CHAMILII: made equivalent to 1D018
1D01A : [*0C28.0020.0002.1D01A] # BYZANTINE MUSICAL SYMBOL ISON ARCHAION
1D046 : [*0C28.0021.0002.1D046] # BYZANTINE MUSICAL SYMBOL ISON NEO: made equivalent to 1D01A
1D01B : [*0C29.0020.0002.1D01B] # BYZANTINE MUSICAL SYMBOL KENTIMA ARCHAION
1D04F : [*0C29.0021.0002.1D04F] # BYZANTINE MUSICAL SYMBOL KENTIMA NEO ANO: made equivalent to 1D01B
1D0F1 : [*0C29.0021.0004.1D0F1] # BYZANTINE MUSICAL SYMBOL KENTIMA NEO MESO: made equivalent to 1D01F
1D0F3 : [*0C29.0021.0004.1D0F3] # BYZANTINE MUSICAL SYMBOL KENTIMA NEO KATO: made equivalent to 1D04F
1D01C : [*0C2A.0020.0002.1D01C] # BYZANTINE MUSICAL SYMBOL KENTIMATA ARCHAION
1D04E : [*0C2A.0021.0002.1D04E] # BYZANTINE MUSICAL SYMBOL KENTIMATA NEO ANO: made equivalent to 1D01C
1D0F0 : [*0C29.0021.0003.1D0F0] # BYZANTINE MUSICAL SYMBOL KENTIMATA NEO MESO: made equivalent to 1D04E
1D0F2 : [*0C29.0021.0003.1D0F2] # BYZANTINE MUSICAL SYMBOL KENTIMATA NEO KATO: made equivalent to 1D0F0
1D022 : [*0C30.0020.0002.1D022] # BYZANTINE MUSICAL SYMBOL APODERMA ARCHAION
1D084 : [*0C30.0021.0002.1D084] # BYZANTINE MUSICAL SYMBOL APODERMA NEO: made equivalent to 1D022
1D024 : [*0C32.0020.0002.1D024] # BYZANTINE MUSICAL SYMBOL KLASMA ANO
1D0F7 : [*0C32.0021.0002.1D0F7] # BYZANTINE MUSICAL SYMBOL KLASMA KATO: made equivalent to 1D0F4
1D0F4 : [*0C32.0021.0003.1D0F4] # BYZANTINE MUSICAL SYMBOL KLASMA NEO: made equivalent to 1D0F7
1D026 : [*0C34.0020.0002.1D026] # BYZANTINE MUSICAL SYMBOL PIASMA ARCHAION
1D059 : [*0C34.0021.0002.1D059] # BYZANTINE MUSICAL SYMBOL PIASMA NEO: made equivalent to 1D026
\end{verbatim}

