L2/24-172

Unicode request for 256th, 512th, and 1024th notes and rests

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This request is for shorter notes and rests than are currently supported by Unicode.

Thanks to the International Music Score Library Project (https://imslp.org) for facilitating access to public-domain music scores.

Characters

The proposed characters, along with their PUA points in the Standard Music Font Layout (SMuFL) specification, are as follows. They are displayed in Bravura font, which is available under the SIL Open Font License.

In order to avoid duplicate precomposed characters, we propose encoding the notes as combining flags that would continue the sequence U+1D16E–1D172. Thus a 256th note would be encoded as U+1D158+1D165+1D250, just as a 128th note may currently be encoded as U+1D158+1D165+1D172.

The rests are atomic characters.

Flags

- 1D250 MUSICAL SYMBOL COMBINING FLAG-6 [SMuFL U+E24A].
  Figures 1–7, 9, 11–20, 22.

- 1D251 MUSICAL SYMBOL COMBINING FLAG-7 [SMuFL U+E24C].
  Figures 1–2, 10, 14, 17, 19–20, 22.

- 1D252 MUSICAL SYMBOL COMBINING FLAG-8 [SMuFL U+E24E].
  Figures 2, 8, 10, 19–20.

Rests


1D253 MUSICAL SYMBOL TWO HUNDRED FIFTY-SIXTH REST [SMuFL U+E4EB].
Figures 9, 11, 15, 17–18, 21.


1D254 MUSICAL SYMBOL FIVE HUNDRED TWELFTH REST [SMuFL U+E4EC].
Figures 10, 17, 21.


1D255 MUSICAL SYMBOL ONE THOUSAND TWENTY-FOURTH REST [SMuFL U+E4ED].
Figures 11, 21.

Properties

1D250;MUSICAL SYMBOL COMBINING FLAG-6;Mc;216;L;;;;;N;;;;;
1D251;MUSICAL SYMBOL COMBINING FLAG-7;Mc;216;L;;;;;N;;;;;
1D252;MUSICAL SYMBOL COMBINING FLAG-8;Mc;216;L;;;;;N;;;;;
1D253;MUSICAL SYMBOL TWO HUNDRED FIFTY-SIXTH REST;So;0;L;;;;;N;;;;;
1D254;MUSICAL SYMBOL FIVE HUNDRED TWELFTH REST;So;0;L;;;;;N;;;;;
1D255;MUSICAL SYMBOL ONE THOUSAND TWENTY-FOURTH REST;So;0;L;;;;;N;;;;;

Annotations

1D250 MUSICAL SYMBOL COMBINING FLAG-6
= creates 256th notes.
1D251 MUSICAL SYMBOL COMBINING FLAG-7
= creates 512th notes.
1D252 MUSICAL SYMBOL COMBINING FLAG-8
= creates 1024th notes.

Chart

As the Musical Symbols block (U+1D100–1D1FF) is full, we propose a new “Musical Symbols Supplement” block be allocated.

Musical Symbols Supplement

1D250 1D28F

	1D25	1D26	1D27	1D28
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Background

The shortest note value supported in Unicode is the 128th note, with five flags or beams. In principle, one can extend this convention as far as desired: adding each flag or beam halves the duration of the note, creating 256th notes (six flags), 512th notes (seven flags), 1024th notes (eight flags), and so on. The same pattern is used for rests.

Notes and rests of these durations have been employed by composers of the standard repertoire, such as François Couperin le Grand (1668–1733), Antonio Vivaldi (1678–1741), Wolfgang Amadeus Mozart (1756–1791), Ludwig van Beethoven (1770–1827), and Charles Ives (1874–1954). They also occur in theoretical works. Indeed, their occurrence is quite natural if one writes a floridly decorated *adagio* in 2/8, 3/8, or 4/8 meter, and the first author of this proposal has done so in two of his own musical compositions (see Figures 14 and 15).

The precise limits of support vary between software packages:

- MusixTeX, according to its documentation, supports 256th beamed notes but only 64th rests.
- *Sibelius* supports notes and rests down to 512th (seven flags or beams).
- *MuseScore* supports notes and rests down to 1024th (eight flags or beams).
- LilyPond supports unbeamed notes and rests down to 1024th. It can continue adding beams to notes beyond that.

We propose notes and rests down to 1024th. This is the shortest duration that is supported by SMuFL and MusicXML (a format for exchanging musical score files between applications), the shortest duration for which unbeamed (flagged) notes are attested, and the shortest duration for which both notes and rests are attested.

Following the British system, the 256th, 512th, and 1024th durations would be called *demisemihemidemisemiquaver*, *hemidemisemihemidemisemiquaver*, and *semihemidemisemi-hemidemisemiquaver*, respectively. Only the first is attested, and their unwieldiness is evident, so we do not annotate the proposed characters with these alternative names. The 256th is the shortest duration with an attested practical, non-numerical name in other languages as well, e.g. *semifusa* in Italian, but the nomenclature is not consistent between languages – in Spanish a *semifusa* is a 64th; a 256th is a *semigarrapatea* (see Figure 16).

References

LilyPond documentation. lilypond.org/doc/v2.23/Documentation/notation/writing-rhythms "Durations as short as 1024 notes *[sic]* can be entered but shorter values, while possible, can only be entered as beamed notes."

MusicXML documentation. usermanuals.musicxml.com/MusicXML/Content/EL-MusicXML-type.htm

MusixTEX documentation. texdoc.org/serve/musixtex/0 (See section 25.4 regarding 256th notes.)

Figures

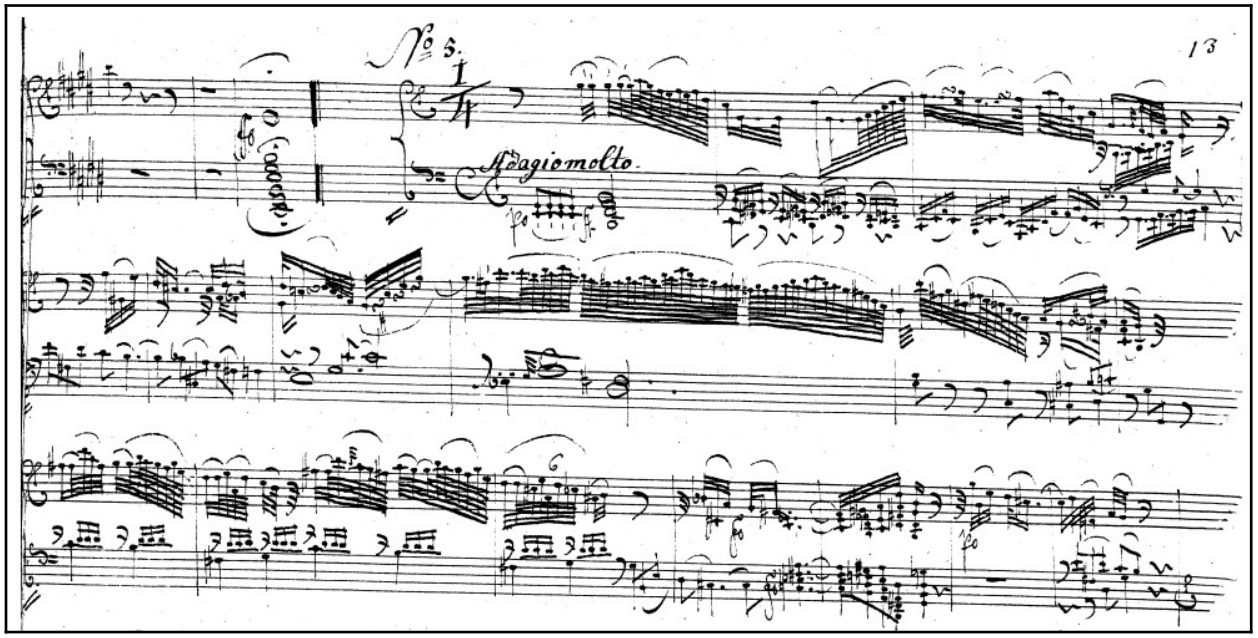


Figure 1. Anton Reicha, *Practische Beispiele*, No. 5, composed 1799–1802. (Undated ms.) An advanced sight-reading exercise for pianists, with many 256th and 512th notes in the upper stave.

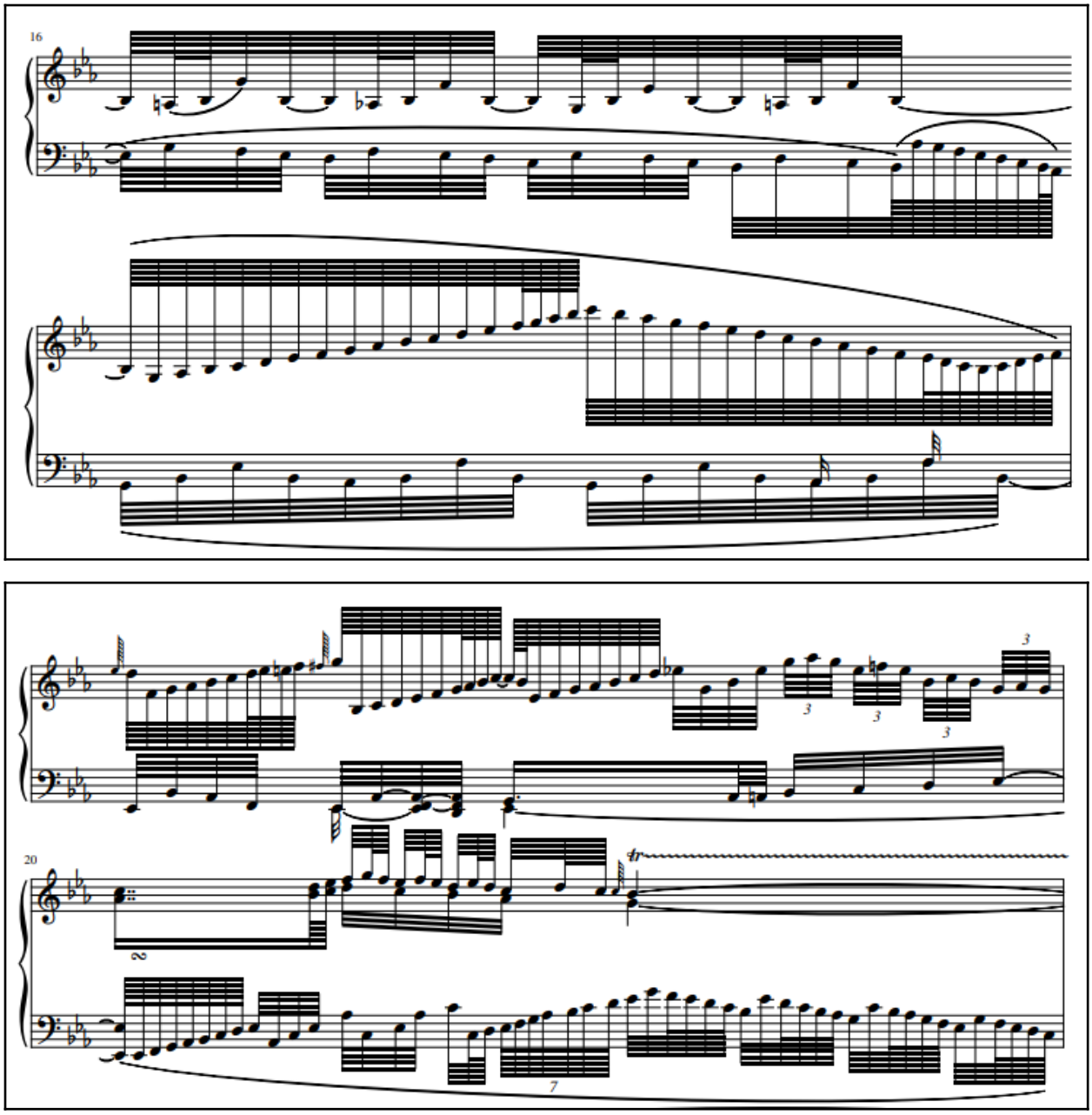


Figure 2. Anthony Philip Heinrich, *Toccata Grande Cromatica*, from *The Sylviad*, Op. 3, composed 1823–1826. (Wilhelm von Hindenburger, 2021–2022, available at s9.imslp.org/files/imglnks/usimg/7/76/IMSLP750977-PMLP1186372-A_P_Heinrich_-_Toccata_Grande_Cromatica.pdf.) Note the many 256th, 512th, and 1024th notes (for the last two, see the bass stave at the end of the first line), along with unbeamed 256ths used as grace notes in the second excerpt.

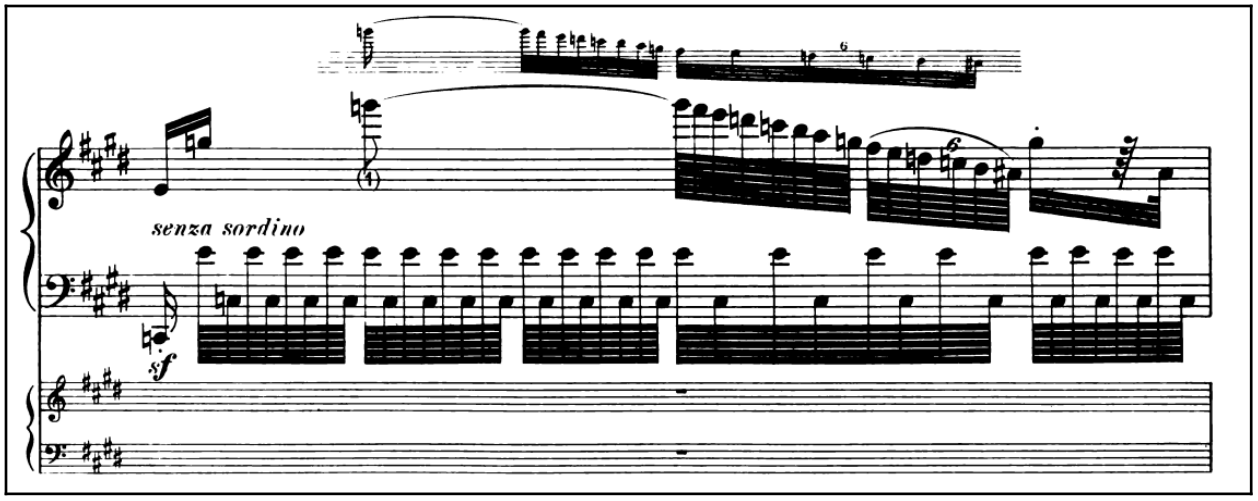


Figure 3. Ludwig van Beethoven, Piano Concerto No. 3, Op. 37, composed 1800. (G. Schirmer, 1901, ed. Franz Kullak and Theodore Baker.) 256th notes in the main text, provided with an easier *ossia* without them.

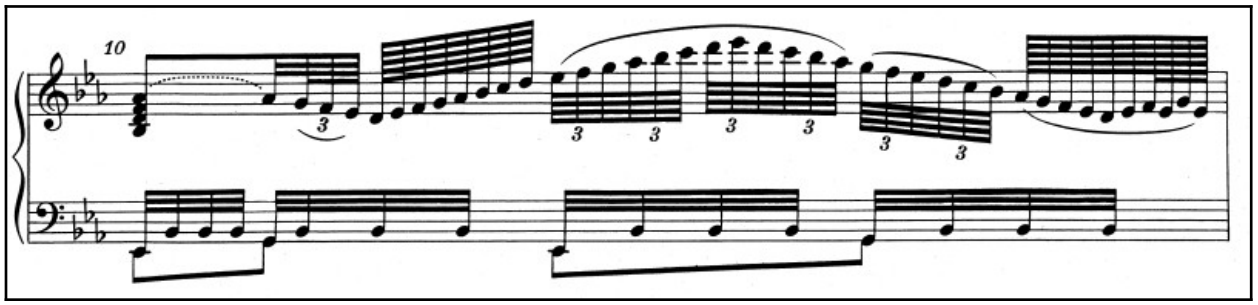


Figure 4. Wolfgang Amadeus Mozart, Variations on *Je suis Lindor*, KV 354, composed 1778. (*Neue Mozart-Ausgabe* IX/26, Bärenreiter Verlag, Kassel, 1961, p. 46). Four 256th notes occur at the end of the first line. (Many editions, including the *Alte Mozart-Ausgabe*, suppress the 256th notes by doubling all the note-values in this variation.)

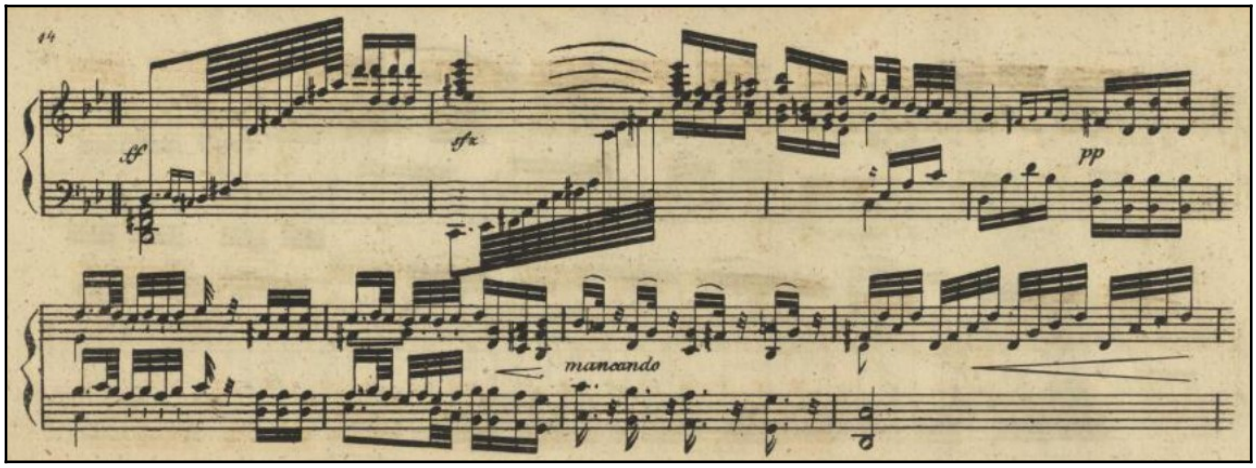
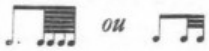
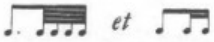


Figure 5. Jan Ladislav Dussek, Piano Sonata Op. 10 No. 2, first published 1789. (Breitkopf & Härtel, n.d. [ca. 1812].) Two 256th notes appear in the first bar.

Il y a, dans le rapport des valeurs, deux particularités des textes originaux que nous avons reproduites, bien qu'elles ne soient pas conformes à nos règles modernes de notation. La première est le nombre de barres, en apparence trop grand, dont sont pourvues certaines notes brèves ; par exemple



pour la valeur d'une noire. Jusqu'à ce jour, les éditeurs modernes, croyant qu'il s'agissait d'erreurs de gravure, ont remplacé ces groupements (je prends comme exemple les deux ci-dessus) par



Or les théoriciens du XVIII^e^ siècle nous donnent l'explication de ces notations : l'exécutant doit donner aux notes brèves la valeur exactement indiquée par le nombre de leurs barres et allonger la note précédente autant qu'il faut pour que l'ensemble ait la durée de la valeur dont il tient la place (une noire dans les deux exemples ci-dessus). Donc

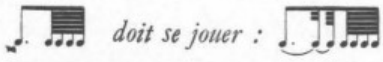


Figure 6. Maurice Cauchie's preface to *L'art de toucher le clavecin* in *Œuvres complètes de François Couperin, I. Œuvres didactiques.* (Éditions de l'Oiseau-Lyre, 1933.) 256th notes are drawn in plain text in a discussion of Couperin's notation.

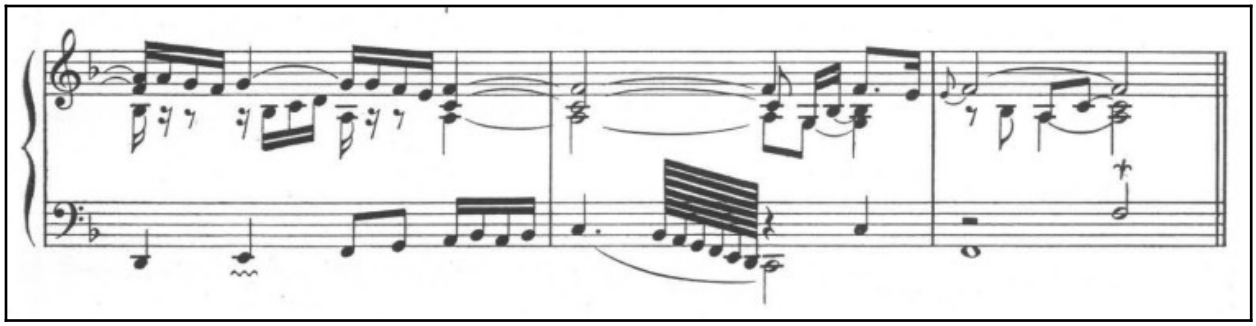


Figure 7. Ibid, *Quatrième Prèlude*. 256th notes in the musical text.

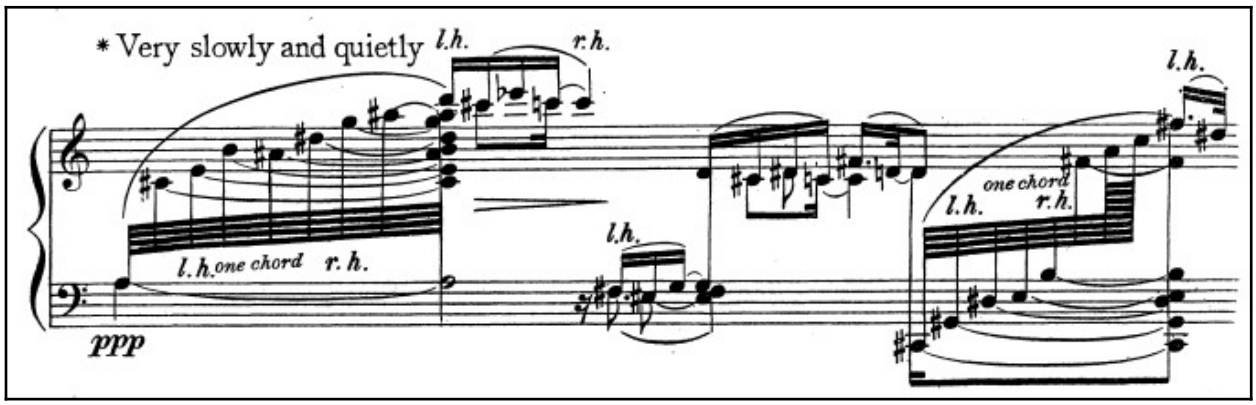


Figure 8. Charles Ives, "Concord" Sonata, beginning of IV. "Thoreau". Composed 1909–1915. (Knickerbocker Press, New York, n.d. [1921].) Two 1024th notes.

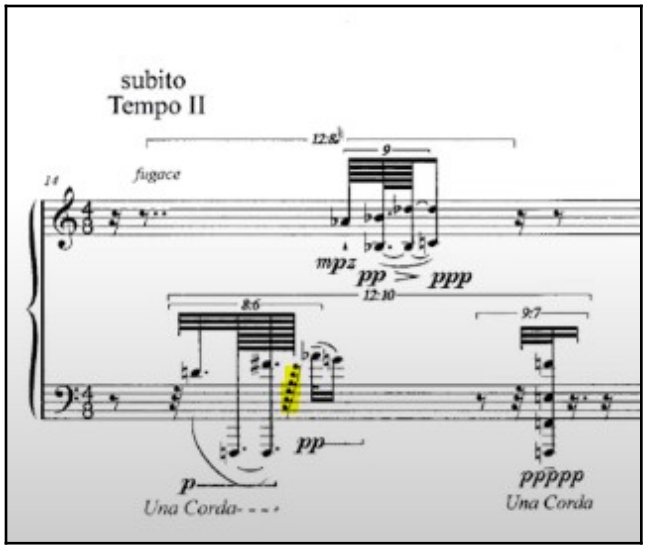


Figure 9. Brian Ferneyhough, *Quirl*, composed 2011-2013. (Edition Peters, 2013.) 256th notes and a 256th rest (highlighted).

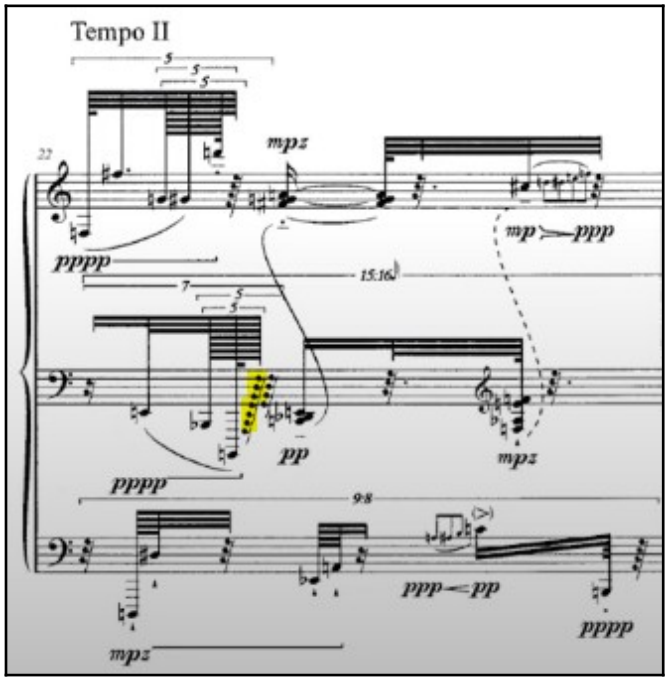


Figure 10. Ibid. A 512th rest next to 512th and 1024th notes.

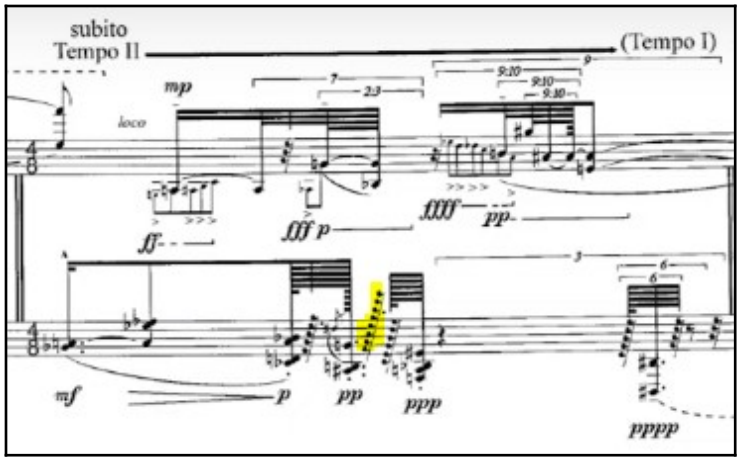


Figure 11. Ibid. A 1024th rest. (A 2048th note occurs beside it, and 4096th notes also appear in this piece, but the corresponding rests could not be located.)

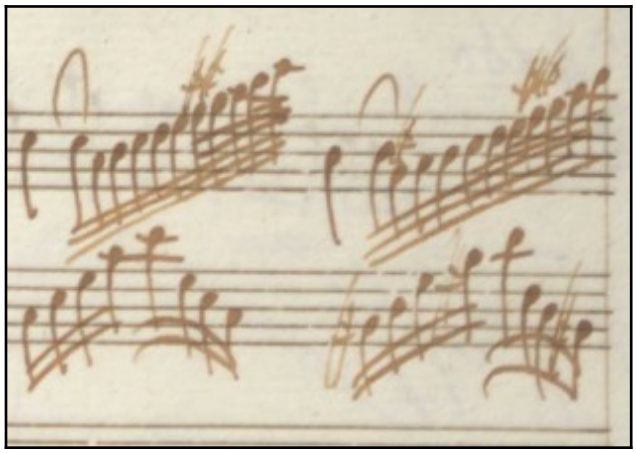


Figure 12. Antonio Vivaldi, Recorder Concerto RV 444, Turin holograph manuscript (between 1700 and 1741). 256th notes at the end of the first beamed group in the upper stave.

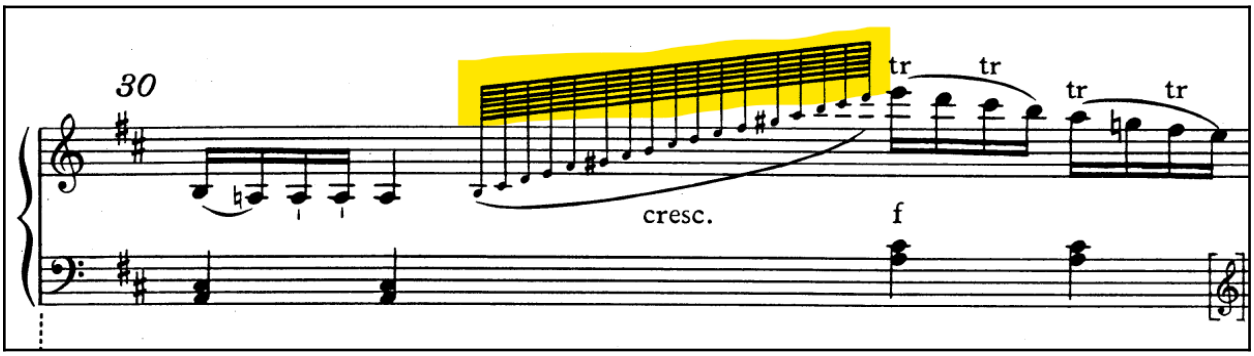


Figure 13. Wolfgang Amadeus Mozart, Piano Sonata KV 284 (composed 1775). From the *Neue Mozart-Ausgabe* IX/25, p. 82 (Bärenreiter Verlag, Kassel, 1986). 256th notes as grace notes.

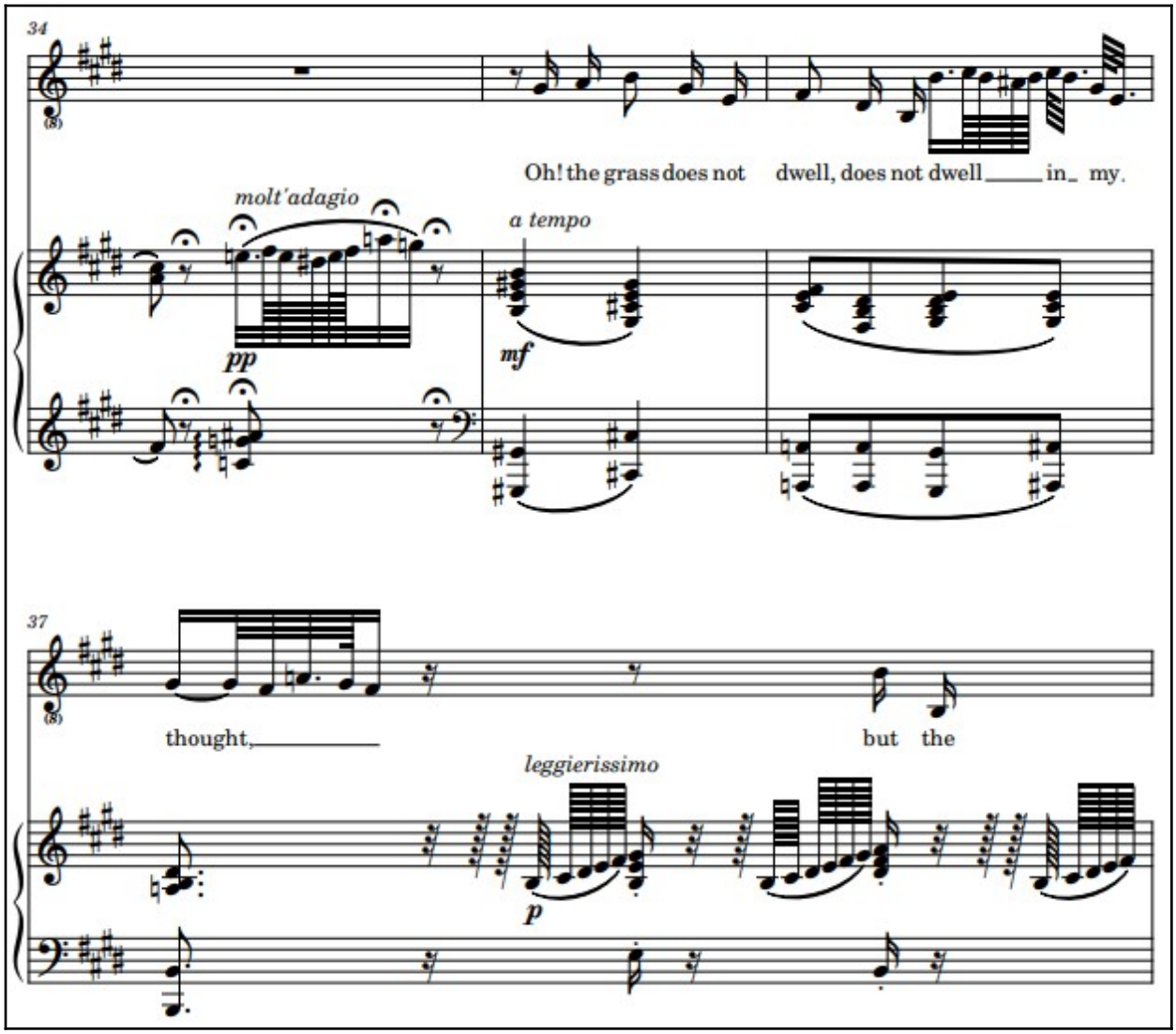


Figure 14. Gavin Jared Bala, *Sweet Maiden*, Op. 3 No. 17, composed 2023. (IMSLP, 2024.) The text is translated from the poem 靜女 in the ancient Chinese *Shijing* 詩經 by James Legge. Beamed 256th and 512th notes, unbeamed 256th notes, and 256th rests.

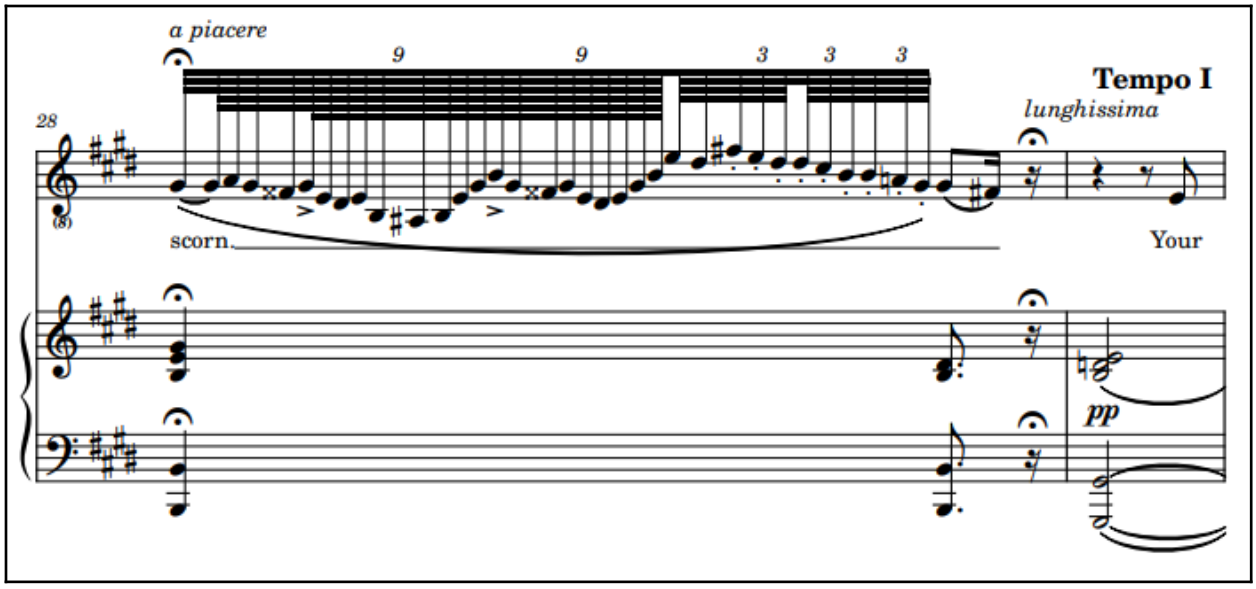
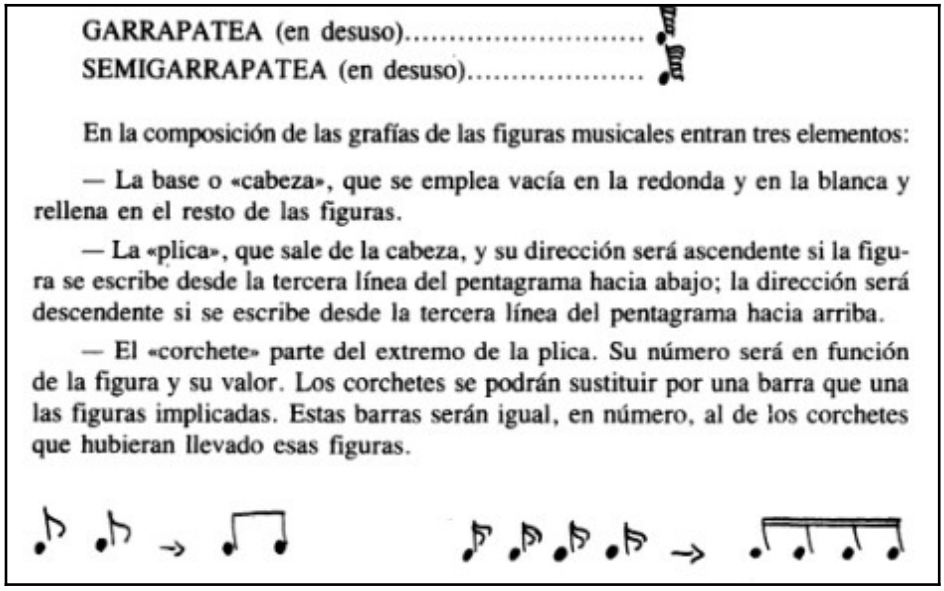


Figure 15. Gavin Jared Bala, *The Great Highway*, Op. 7 No. 7, composed 2023. (IMSLP, 2024.) Translated from the poem 遵大路 in the *Shijing* by James Legge. Beamed 256th notes in a written-out cadenza.


GARRAPATEA (en desuso).....
SEMIGARRAPATEA (en desuso).....

En la composición de las grafías de las figuras musicales entran tres elementos:

— La base o «cabeza», que se emplea vacía en la redonda y en la blanca y rellena en el resto de las figuras.

— La «plica», que sale de la cabeza, y su dirección será ascendente si la figura se escribe desde la tercera línea del pentagrama hacia abajo; la dirección será descendente si se escribe desde la tercera línea del pentagrama hacia arriba.

— El «corchete» parte del extremo de la plica. Su número será en función de la figura y su valor. Los corchetes se podrán sustituir por una barra que una las figuras implicadas. Estas barras serán igual, en número, al de los corchetes que hubieran llevado esas figuras.

Figure 16. Josefa Lacárcel Moreno, *Musicoterapia en educación especial* (Universidad de Murcia, 1995, p. 489). 128th and 256th notes illustrated with their Spanish names *garrapatea* and *semigarrapatea*. The *garrapatea* is also known as a *cuartifusa*; a *semifusa* is a 64th note or rest. (See Figure 17.) One might therefore expect **cuartigarrapatea* for a 512th note or rest, but this is unattested.

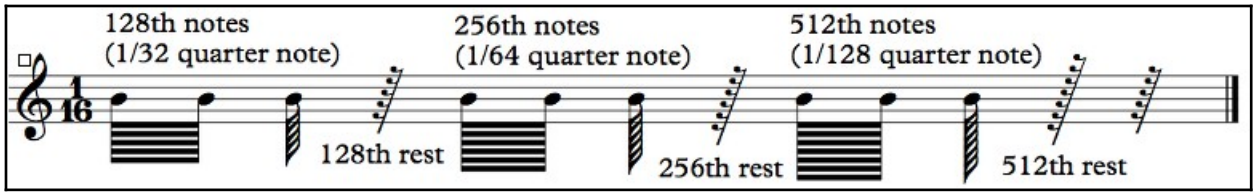


Figure 17. 256th and 512th notes and rests, from Offtonic Theory (offtonic.com/theory/book/1-4.html).

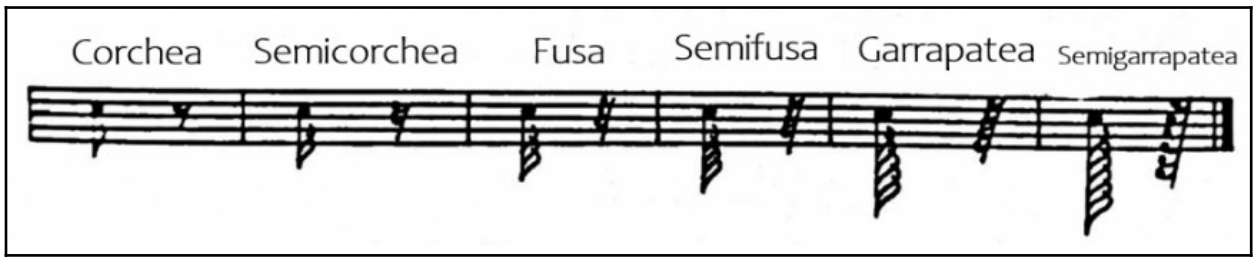


Figure 18. Unbeamed quarter to 256th notes and rests, from *Autoproducción Musical* (autoproduccionmusical.com/leccion/las-notas-y-las-figuras-musicales/).

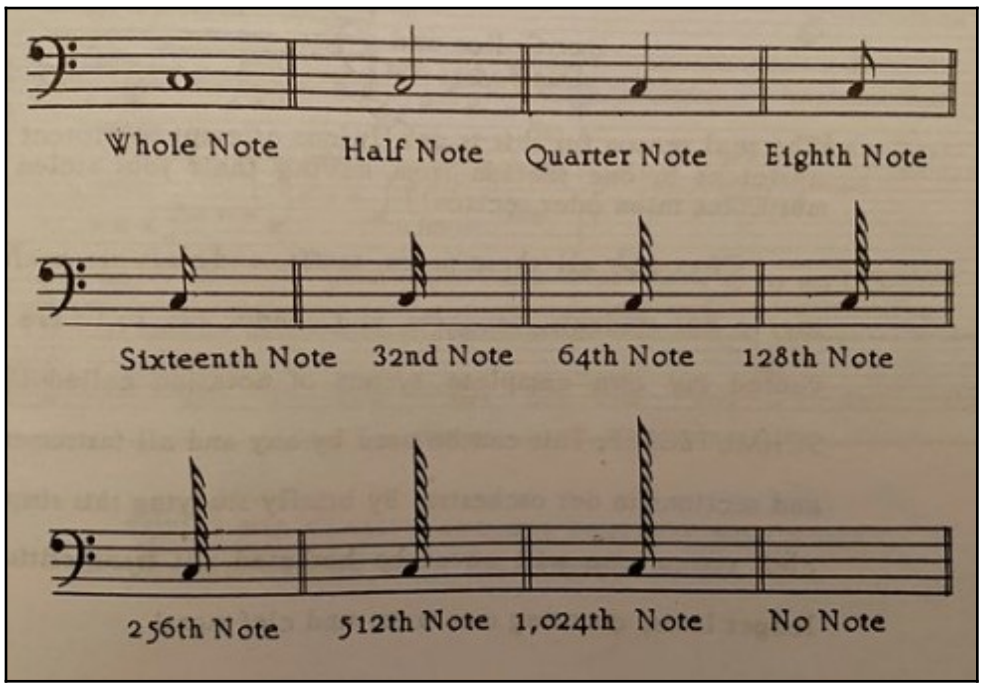


Figure 19. The note values illustrated from whole note to 1024th note (www.pinterest.com/pin/music-misc-and-education--432486370475283589/).

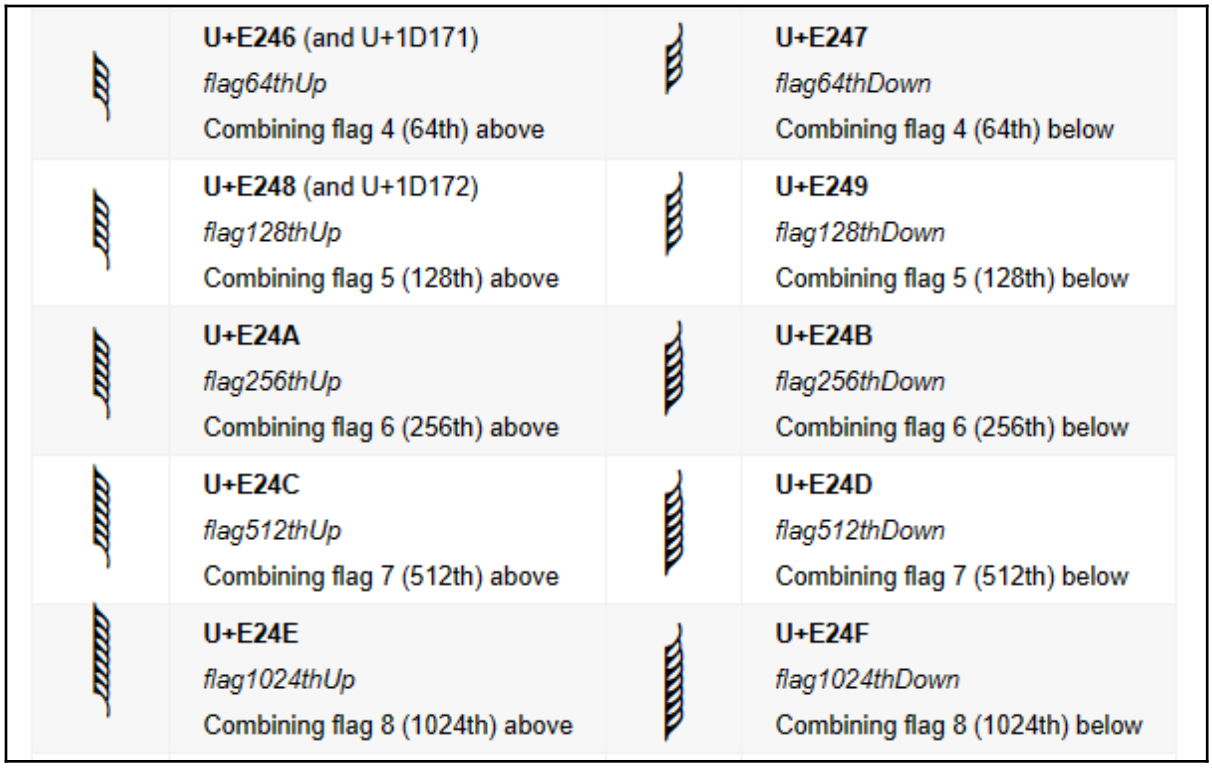


Figure 20. Flags for the shortest note values in SMuFL (64th to 1024th). SMuFL disunifies up- and down-stemmed flags, but Unicode does not.

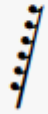
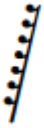
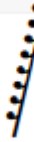
	U+E4E2 (and U+1D13A) *restDoubleWhole* Double whole (breve) rest		**U+E4E3** (and U+1D13B) *restWhole* Whole (semibreve) rest
	U+E4E4 (and U+1D13C) *restHalf* Half (minim) rest		**U+E4E5** (and U+1D13D) *restQuarter* Quarter (crotchet) rest
	**U+E4E6** (and U+1D13E) *rest8th* Eighth (quaver) rest		**U+E4E7** (and U+1D13F) *rest16th* 16th (semiquaver) rest
	**U+E4E8** (and U+1D140) *rest32nd* 32nd (demisemiquaver) rest		**U+E4E9** (and U+1D141) *rest64th* 64th (hemidemisemiquaver) rest
	**U+E4EA** (and U+1D142) *rest128th* 128th (semihemidemisemiquaver) rest		**U+E4EB** *rest256th* 256th rest
	**U+E4EC** *rest512th* 512th rest		**U+E4ED** *rest1024th* 1024th rest

Figure 21. Rests in SMuFL, from breve to 1024th.

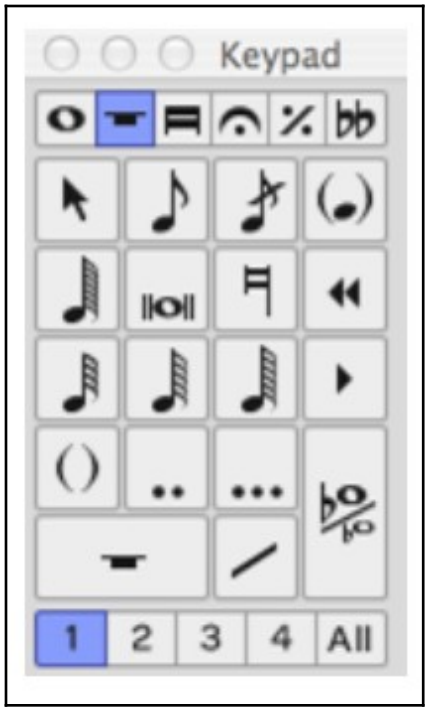


Figure 22. The *More notes* keypad in *Sibelius* (image from the reference manual, resources.avid.com/SupportFiles/Sibelius/2020.12/Sibelius_Reference.pdf), providing breve, 64th, 128th, 256th, and 512th notes. (In the third row is the mensural *longa* note, encoded at U+1D1B7.)

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 (P & P) from std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html for guidelines and details before filling this form.
Please ensure you are using the latest Form from std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.
See also std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html for latest *Roadmaps*.

A. Administrative

1. **Title:** *Unicode request for 256th, 512th, and 1024th notes and rests*
2. Requester's name: *Gavin Jared Bala, Kirk Miller*
3. Requester type (Member body/Liaison/Individual contribution): *individual*
4. Submission date: *2024 July 05*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *yes*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *yes*
      Proposed name of script: *Musical Symbols Supplement*
   b. The proposal is for addition of character(s) to an existing block: *no*
      Name of the existing block:
2. Number of characters in proposal: *6*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary ; B.1-Specialized (small collection) x ; B.2-Specialized (large collection) ;
   C-Major extinct ; D-Attested extinct ; E-Minor extinct ;
   F-Archaic Hieroglyphic or Ideographic ; G-Obscure or questionable usage symbols
4. 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*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? *Kirk Miller*
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): *Bravura font under the SIL Open Font License*
6. 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*
7. 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*

8. Additional Information:

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 www.unicode.org for such information on other scripts. Also see Unicode Character Database (www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the

1. Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

Unicode Technical Committee for inclusion in the Unicode Standard.

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? *Author is a member of the user community*
   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? *no*
   Reference:
4. The context of use for the proposed characters (type of use; common or rare) *music*
   Reference:
5. Are the proposed characters in current use by the user community? *yes*
   If YES, where? Reference: *See figures*
6. After giving due considerations to the principles in the P&P 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, or could be confused with, an existing character? *no*
    If YES, is a rationale for its inclusion provided?
    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 characters? *no*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: