

Unicode request for triple and quadruple flat

Gavin Jared Bala, gavin.jared, gmail.com

Kirk Miller, kirkmiller, gmail.com

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This request is for the triple-flat and quadruple-flat accidentals, $\langle \text{♯♯♯} \rangle$ and $\langle \text{♯♯♯♯} \rangle$, extending the standard accidentals of U+266D MUSIC FLAT SIGN $\langle \flat \rangle$ and U+1D12B MUSICAL SYMBOL DOUBLE FLAT $\langle \text{♭♭} \rangle$.

Equivalent sharps are not needed. Triple sharp is typically written $\langle \text{♯*} \rangle$ or $\langle \text{*♯} \rangle$, and quadruple sharp $\langle \text{***} \rangle$. Idiosyncratic $\langle \text{*} \rangle$ (SMuFL U+E265) is attested for triple sharp, with $\langle \text{♯*} \rangle$ for the quadruple (Figure 13), but this is rare and should presumably be encoded as the teardrop-spoked asterisk, U+273B, or some similar character.

An argument could be made to ignore the precedent of the double flat U+1D12B and typeset the triple and quadruple flats as sequences, as is done with the sharps. However, there are three sequences that would be equivalent to a triple flat – namely $\flat + \text{♭♭}$, $\text{♭♭} + \flat$, and $\flat + \flat + \flat$ – which would all be rendered the same. Unicode support would require the addition of decompositions for these to be equivalent.

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

Characters

♯♯♯ U+1D260 MUSICAL SYMBOL TRIPLE FLAT. Figures 3–4, 9–14.

♯♯♯♯ U+1D261 MUSICAL SYMBOL QUADRUPLE FLAT. Figures 1, 9, 13.

Properties

1D260;MUSICAL SYMBOL TRIPLE FLAT;So;0;ON;;;;;N;;;;;

1D261;MUSICAL SYMBOL QUADRUPLE FLAT;So;0;ON;;;;;N;;;;;



















Chart

Characters in grey cells are proposed elsewhere.

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

Theoretically speaking, the circle of fifths extends forever, and one can proceed indefinitely from naturals to single accidentals, double accidentals, triple accidentals and so forth. In a twelve-tone equal-tempered context, these denote semantic differences. For example, the chord A-C#-E-G is a dominant 7th, but the enharmonically equivalent chord A-C#-E-F* is a German augmented sixth. The two notations imply different resolutions. In other contexts, such as with just intonation, such chords may be aurally distinct as well (in kleisma in Figure 4; also Figure 13).

With twelve-tone equal temperment, some chords and intervals technically require writing triple and quadruple accidentals. For instance, a diminished seventh above C♭ is B♭♭, not the enharmonically equivalent A♭, and an augmented fifth above B# is F#*, not its enharmonic equivalent G#. Most composers will however write the imprecise but more readable enharmonic equivalent. For example, the A# grace note in bar 94 of the 3rd movement of Chopin's Third Piano Sonata (in the Paderewski edition) should theoretically be written <G#*>, but for practical reasons it is not. Nonetheless, written triple and quadruple accidentals are encountered in real works as well as in theoretical texts.

We request the triple and quadruple flats, as they may be written as ligatures just as the double flat <♭♭> may be, but not the equivalent sharps. The triple sharp sometimes appears as <#*#>, and sometimes as <*#>; it is too rare to speak of a standard format, though SMuFL gives <#*> as the reference glyph. Either way, it does not form a ligature. Similarly with the quadruple sharp <*#*#>.

Figures

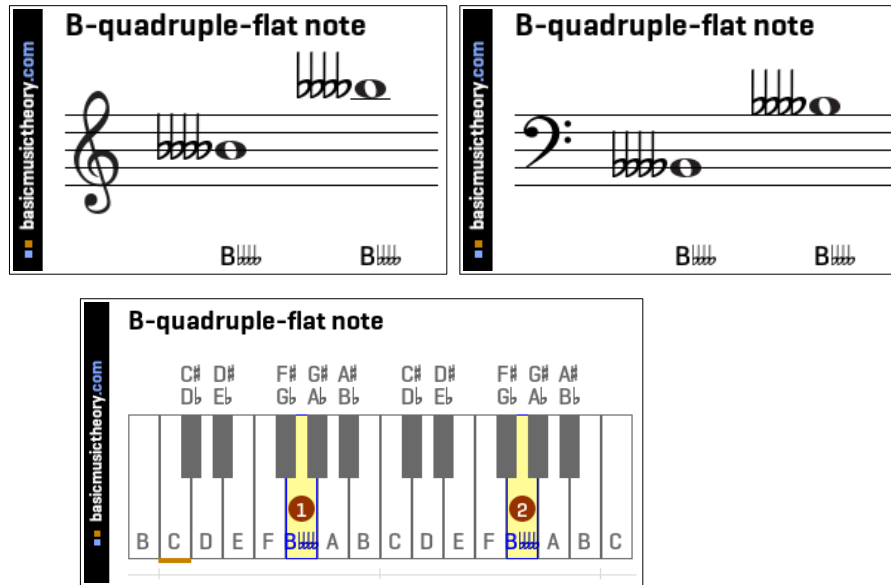


Figure 1. Veler Ltd (2023) Music Theory (basicmusictheory.com/b-quadruple-flat-note). A ligature $\langle \text{bbb} \rangle$ is used for the quadruple flat sign. B quadruple flat, $B\text{bbb}$, is four half-tones (semitones) down from B, and on the piano keyboard is the same key as G – that is, it is enharmonically equivalent to G (bottom).

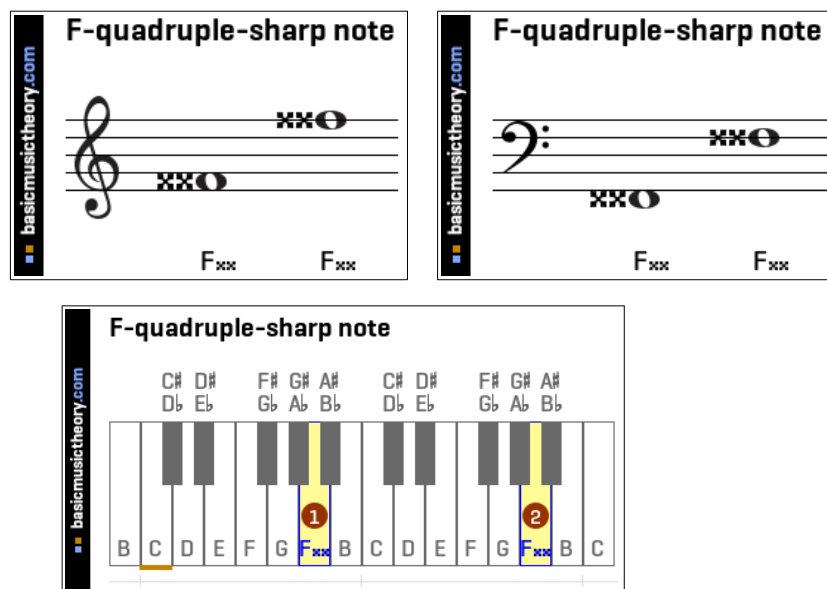


Figure 2. Veler Ltd (2023) Music Theory (basicmusictheory.com/f-quadruple-sharp-note). A sequence of two non-ligated double sharp signs $\langle \text{xx} \rangle$ is used for F quadruple sharp, $F\text{xx}$. This note is four semitones up from F, the same key on the piano as A (bottom).

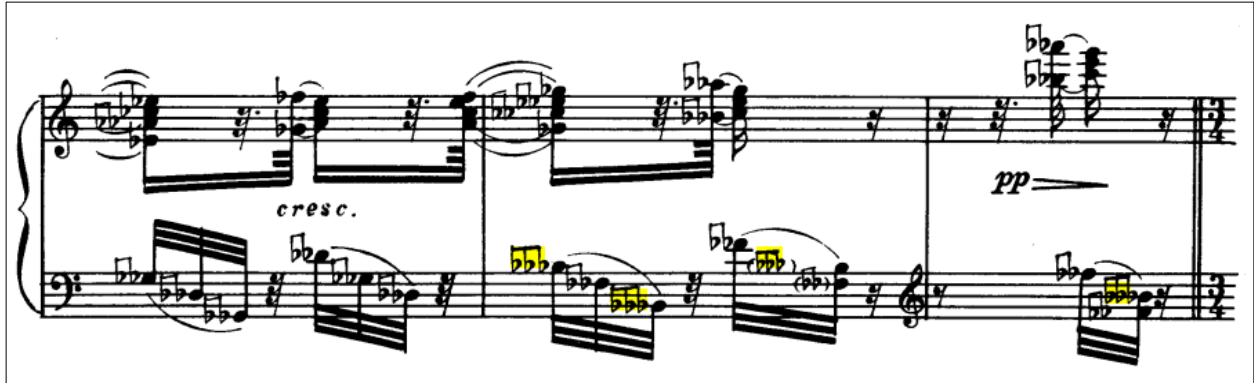


Figure 3. N. Roslavets, Piano Sonata No. 1 (ed. E. Babasyan, pub. Muzyka, Moscow, 1990). Both the double and triple flats in this score are notated with a rare variant of the ligatures, in which the component flat signs are connected by a beam.

	Just m3	6 just m3s	Just P5	12TET	19TET	34TET	53TET	72TET
Ratio	6 : 5	(6 : 5) ⁶	3 : 2	2 ⁷ /12 / 2 ⁶ /12	2 ¹¹ /19	2 ²⁰ /34	2 ³¹ /53	2 ⁴² /72
Letter name	E _b	A _{bbb} +	G	G / A _{bbb}	G / A _{bbb}			
Cents	315.64	693.84	701.96	700 / 600	694.74	705.88	701.89	700

The interval was named by [Shohé Tanaka](#) after the Greek for "closure",^[2] who noted that it was tempered out to a unison by 53 equal temperament.^[3] It is also tempered out in 19, 34, and 72 equal temperament.

Figure 4. Wikipedia article on kleisma (en.wikipedia.org/wiki/Kleisma). Triple-flat ligatures <bbb>, similar to the usual double-flat ligature <bb>, in a discussion of microtonal music theory. Graphics are used to render the ligature.



In the foregoing examples of the minor scales it will be noticed that VII is always raised, by an accidental, a half step higher than the signature would make it. This is done in the keys of D minor, G minor, A minor, E minor, B minor, F# minor, and C# minor, by placing an accidental sharp (#) before it; in the keys of G# minor, D# minor, A# minor, E# minor, and B# minor, by placing a double sharp (x) before it; and in the key of Gx minor, by placing a triple sharp (#x) before it. In the key of C minor, F minor, Bb minor, Eb minor, Ab minor, Db minor, and Gb minor, VII is made a half step higher than the signature would make it, by placing an accidental natural (n) before it, (thus removing the flat in the signature), and in the keys of Cb minor, Fb minor, and Bbb minor, by removing the double flat of the signature (bb), and substituting a single flat in its place.

The character which represents a double sharp (## or x) always denotes a tone a whole step higher than would be represented by the note before which it is placed, if that note was in the key of C, with no accidental before it.

The character which represents a double flat (bb) always denotes a tone a whole step lower than would be represented by the note before which it is placed, if that note was in the key of C, with no accidental before it.

The character which represents a triple sharp (#x) always denotes a tone a step and a half higher than would be represented by the note before which it is placed, if that note was in the key of C, with no accidental before it.

The character which represents a triple flat (bbb) always denotes a tone a step and a half lower than would be represented by the note before which it is placed, if that note was in the key of C, with no accidental before it.

Figure 5. Artemas Nixon Johnson (1854). *Practical Instructions in Harmony, Upon the Pestalozzian Or Inductive System*. Ditson, pp. 53–55. A theoretical treatise including keys with double accidentals in the key signature (these hardly ever arise in practice). Here the multiple accidentals do not form ligatures. There is an inconsistency on the triple sharp: in the first excerpt it is written <#x>, but in the second and third it is written <##>. <##> is presented as a variant of the double sharp <#>; this is not acceptable in present practice.

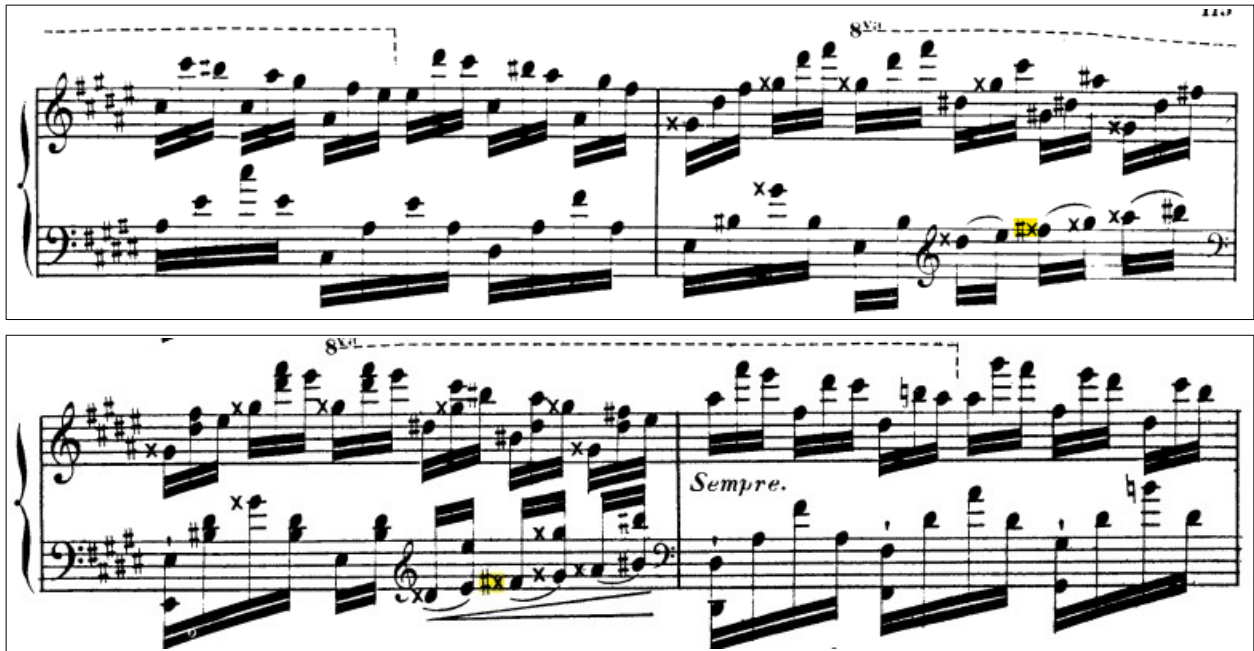


Figure 6. Ch.-V. Alkan, Etude Op. 39 No. 10 (Richault, Paris, 1857). Two triple sharps, both in the $\langle \#* \rangle$ form.



Figure 7. M. Reger, Clarinet Sonata Op. 49 No. 2 (Universal Edition, Vienna, 1904). A triple sharp in the $\langle * \# \rangle$ form. Compare this with the “multiple-accidental” $\langle \# \# \rangle$ in the previous bar, which is a traditional way of cancelling a double-sharp; neither is a single atomic character.



Figure 8. A. Reicha, Fugue Op. 36 No. 34 (Magasin de l'imprimerie chymique, Vienna, 1804). A triple sharp in the $\langle \#* \rangle$ form.

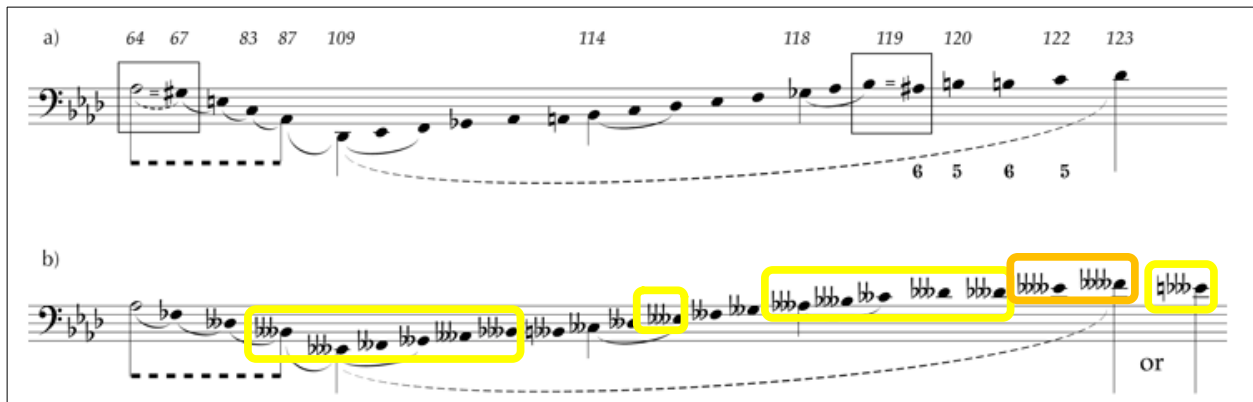


Figure 9. Eric Wen (2011). E-quadruple flat: Tovey's Whimsy. *Zeitschrift der Gesellschaft für Musiktheorie* 8 (1): 77–89. Triple-flat (yellow) and quadruple-flat (orange) equivalents in staff (b) of how the passage in staff (a) would look without the boxed enharmonic changes. (The passage analyses an excerpt from Beethoven's *Appassionata* Sonata, Op. 57.)

23
 dread - ing his se - ve - ri - ty, I must re - press the
 fear of him a - lone holds me, or to thine arms I'd
 swear its truth by that day's eye, whose pier - cing glance. I

Figure 10. G. J. Bala, *In Carriage Grand*, Op. 6 No. 9, composed 2023. (IMSLP, 2024.) Setting of James Legge's translation of the poem 大車 from the *Shijing*. Triple-flat ligature typeset with MuseScore.

Figure 11. Evelyn Mathis, 26-EDO Nocturne No. 1 in F-sharp minor, Op. 8. Triple flats. (Score available at musescore.com). Also a triple sharp in the <#*> form.

Figure 12. Stephen Weigel, 26-TET arrangement of 'I'll Be Seeing You' ([Youtube.com](https://www.youtube.com)).

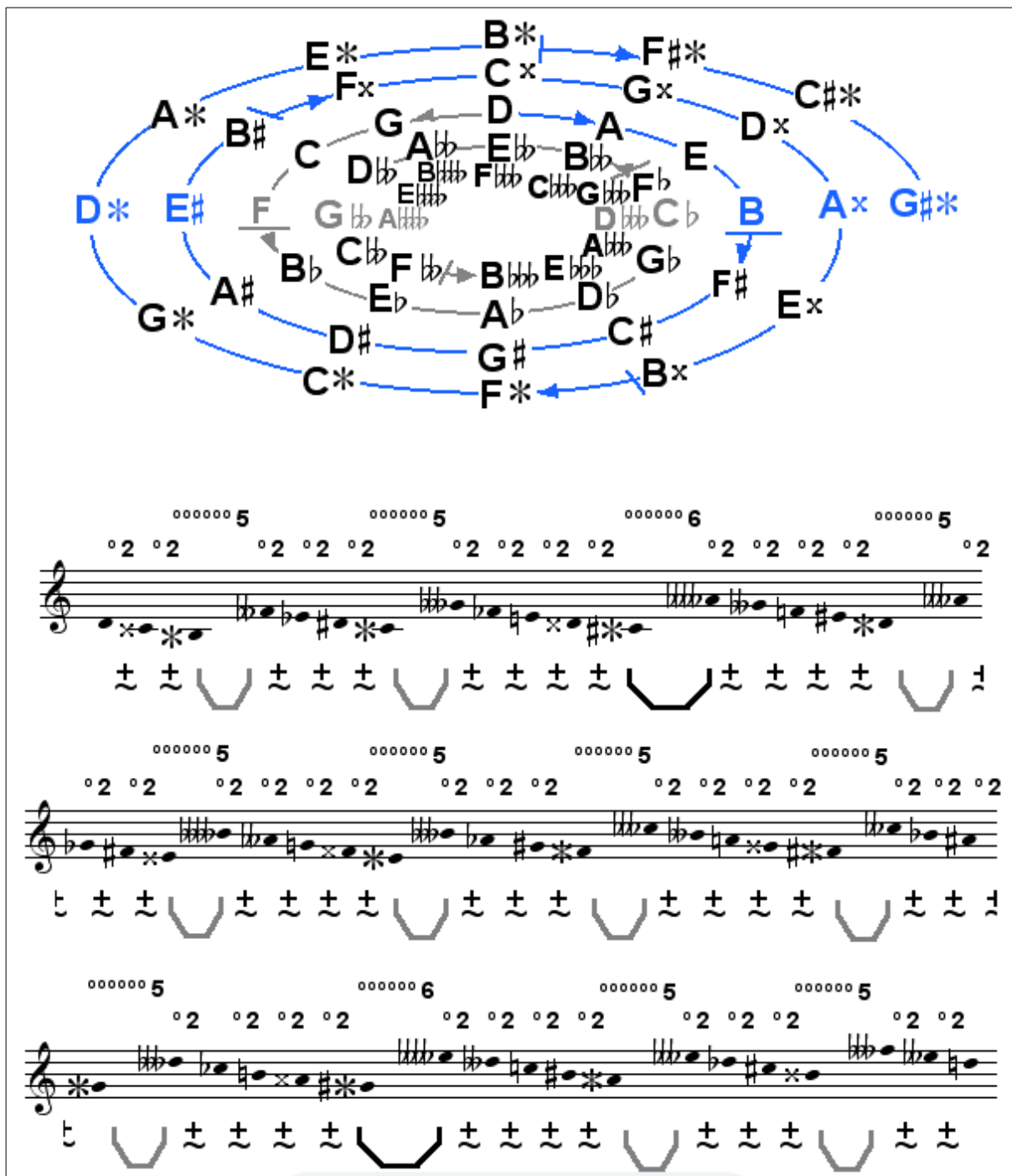


Figure 13. A discussion of notation for a chain of 55 pure fifths by Aaron Andrew Hunt (musictheory.zentral.zone/superscales5.html). Triple and quadruple flats $\langle\text{bbb}\rangle$ and $\langle\text{bbbb}\rangle$ appear, as does a unique glyph $\langle*\rangle$ for the triple sharp (the quadruple sharp is written $\langle\#\#\#\#\rangle$), which seems to be unique to this source. Historically, the double-sharp sign $\langle\#\#\rangle$ is two lines crossing (as in Figure 5, but also apparent in this figure); perhaps the $\langle*\rangle$ glyph is an extension of that idea, with three lines crossing.

Glyph	Description	Glyph	Description
<i>b</i>	U+E260 (and 266D) <i>accidentalFlat</i> Flat	<i>♮</i>	U+E261 (and 266E) <i>accidentalNatural</i> Natural
<i>#</i>	U+E262 (and 266F) <i>accidentalSharp</i> Sharp	<i>×</i>	U+E263 (and U+1D12A) <i>accidentalDoubleSharp</i> Double sharp
<i>bb</i>	U+E264 (and U+1D12B) <i>accidentalDoubleFlat</i> Double flat	<i>##×</i>	U+E265 <i>accidentalTripleSharp</i> Triple sharp
<i>bbb</i>	U+E266 <i>accidentalTripleFlat</i> Triple flat	<i>♮b</i>	U+E267 <i>accidentalNaturalFlat</i> Natural flat
<i>♮#</i>	U+E268 <i>accidentalNaturalSharp</i> Natural sharp	<i>##</i>	U+E269 <i>accidentalSharpSharp</i> Sharp sharp
<i>(</i>	U+E26A <i>accidentalParensLeft</i> Accidental parenthesis, left	<i>)</i>	U+E26B <i>accidentalParensRight</i> Accidental parenthesis, right
<i>[</i>	U+E26C <i>accidentalBracketLeft</i> Accidental bracket, left	<i>]</i>	U+E26D <i>accidentalBracketRight</i> Accidental bracket, right

Figure 14. The standard accidentals in SMuFL, including triple sharps and flats (w3c.github.io/smuf/latest/tables/standard-accidentals-12-edo.html).

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646.
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 triple and quadruple flat

2. Requester's name: Gavin Jared Bala, Kirk Miller

3. Requester type (Member body/Liaison/Individual contribution): individual

4. Submission date: 2024 September 20

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: 2

3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary	<input type="checkbox"/>	B.1-Specialized (small collection)	<input checked="" type="checkbox"/>	B.2-Specialized (large collection)	<input type="checkbox"/>
C-Major extinct	<input type="checkbox"/>	D-Attested extinct	<input type="checkbox"/>	E-Minor extinct	<input type="checkbox"/>
F-Archaic Hieroglyphic or Ideographic	<input type="checkbox"/>	G-Obscure or questionable usage symbols		<input type="checkbox"/>	<input type="checkbox"/>

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.): Kirk Miller

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 Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? If YES explain	<i>no</i>
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.)? If YES, with whom? If YES, available relevant documents:	<i>yes</i> <i>Author is a member of the user community</i>
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Reference:	<i>no</i>
4. The context of use for the proposed characters (type of use; common or rare) Reference:	<i>music</i>
5. Are the proposed characters in current use by the user community? If YES, where? Reference:	<i>yes</i> <i>See figures</i>
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? If YES, is a rationale provided? If YES, reference:	<i>no</i>
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	<i>yes</i>
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? If YES, is a rationale for its inclusion provided? If YES, reference:	<i>no</i>
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? If YES, is a rationale for its inclusion provided? If YES, reference:	<i>no</i>
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? If YES, is a rationale for its inclusion provided? If YES, reference:	<i>no</i>
11. Does the proposal include use of combining characters and/or use of composite sequences? 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:	<i>no</i>
12. Does the proposal contain characters with any special properties such as control function or similar semantics? If YES, describe in detail (include attachment if necessary)	<i>no</i>
13. Does the proposal contain any Ideographic compatibility characters? If YES, are the equivalent corresponding unified ideographic characters identified? If YES, reference:	<i>no</i>