L2/20-159

Proposal to encode two accidentals for Iranian classical music

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April 23, 2020

Background

Modern Iranian classical music commonly uses two accidental symbols for microtones. They are frequently referred to as “quarter tones” (ربع پرده), although the tones are not exactly at equal temperament, causing some experts to avoid the term quarter tone for them.

The symbols themselves were invented in early twentieth century by Colonel Ali-Naqi Vaziri, who was the key player in formalizing Iranian classical music and its modal systems, as well as adapting Western musical notation for it.

The characters are similar in function to encoded characters U+1D132 MUSICAL SYMBOL QUARTER TONE SHARP and U+1D133 MUSICAL SYMBOL QUARTER TONE FLAT, which are just one style among various notations used for such quarter tones. (There is a wide range of accidentals used in Western music not yet encoded in Unicode. See Spreadbury 2019 for more information and an extended list.) The Iranian symbols are different from the two encoded quarter tones in appearance, usage, and their exact tonal value.

The examples in this proposal have been found by Hadi Abdi Khojasteh, Nasir Haghighi, Hamed Khoramyar, Abbas Momen, and Twitter users @amir_m01, @i_m_just_hamed, and @toutfarangi. The author is very grateful to them for their help in making this proposal a reality.

Proposal

Encode the following two characters in the Unicode Standard:

Glyph	Codepoint	Name
	1D1E9	MUSICAL SYMBOL SORI
	1D1EA	MUSICAL SYMBOL KORON

The proposed character properties follow:

UnicodeData.txt

```
1D1E9;MUSICAL SYMBOL SORI;So;0;ON;;;;;N;;;;;
1D1EA;MUSICAL SYMBOL KORON;So;0;ON;;;;;N;;;;;
```

Note that the bidirectional class suggested is ON, for two reasons: to match the three other common symbols these are used in similar contexts with (U+266D MUSIC FLAT SIGN, U+266E MUSIC NATURAL SIGN, and U+266F MUSIC SHARP SIGN); and also because they are frequently used in right-to-left situations, where a strong left-to-right character could mess up the bidi context.

All other properties should be similar to U+266D MUSIC FLAT SIGN.

Suggestion for NamesLists.txt

1D1E9 MUSICAL SYMBOL SORI

* Used in Iranian classical music for “quarter tones”

1D1EA MUSICAL SYMBOL KORON

* Used in Iranian classical music for “quarter tones”

Samples of usage

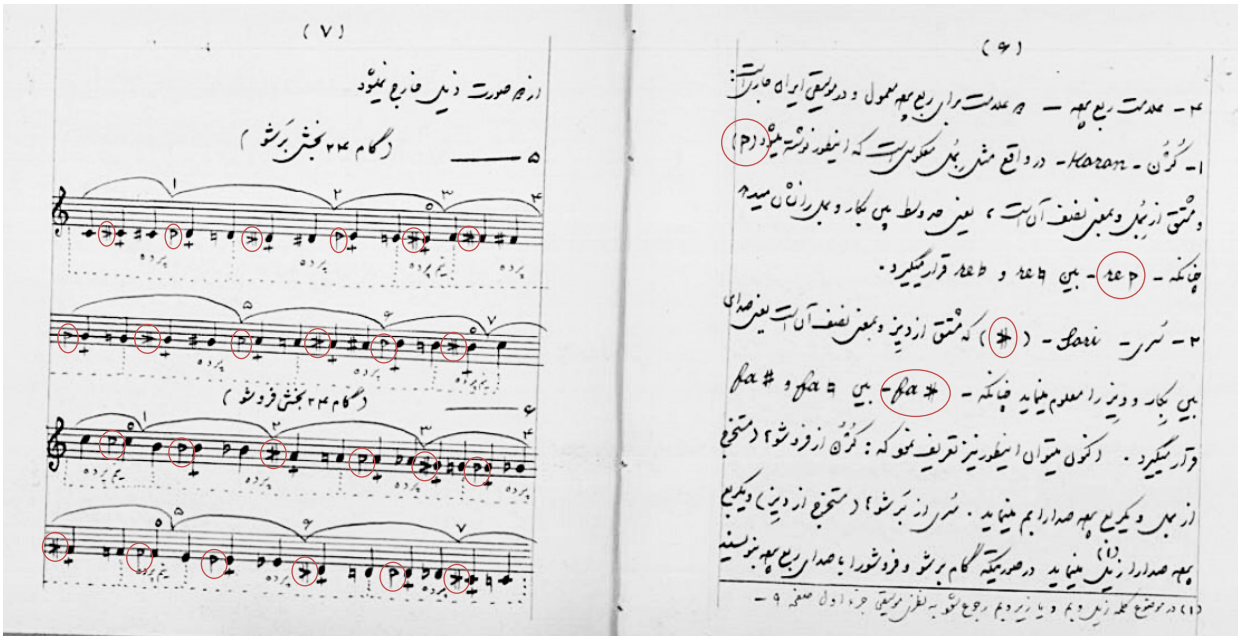
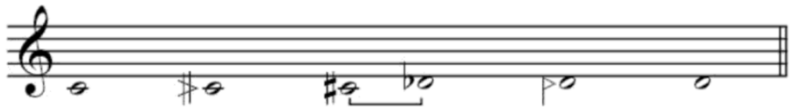


Figure 1. Introduction of the proposed characters, in Vaziri’s own handwriting, from Vaziri 1935, pp. 6–7.

THE INTERVALS

The method of dividing the whole tone into microintervals is much discussed by Iranian musicians. The first and most direct method is to divide the whole tone into four equal parts. The intervals between C and D are represented as C-C¼-C½-C¾-D, or in musical notation as C𝄲-C𝄳-C♯-D. Measuring the system in acoustical cents we get the for C = 0, C¼ =50, C½-100, C¾ = 150 and D = 200. The second system of dividing a whole tone is the most recent in use. It is of Greek origin and the dividing units are values of limma and comma. The limma has 90 cents, the comma 24 cents. The whole tone would be thus divided as C = 0, C_1 = 24 (one comma) - C_2 = 90 (one limma) - C_3 = 114 (one limma and one comma) - D = 204 (two limmas and one comma). The whole tone is 4 cents sharp, but would be equalized in the full scale. A considerable difference exists between the first intervals C¼ and C_1, and the third intervals C¾ and C_3. This difference has risen a lot of discussion among theorists, but in practice the two systems merge and differ from player to player. For the first microtone above C (either C¼ or the comma C_1 the sign 𝄲 (*sori; سري*) is suggested and for the third microtone (C¾ or the limma+comma C_3) the sign 𝄢 *(koron; كرن).* In practice this accidental is used for flattening the E by one microtone (D𝄢). The system looks like that:



Whatever the signs mean in musical practice, one could consider the koron as a non exact "half-flat" or a ¾-tone. D𝄢 (D-*koron*) is located approximately between C𝄲 and D♭. The ¾ tone above D is E𝄢, but since the interval E-F is a ½-step, a ¾ tone above E will be F 𝄳 (F-*sori*). Similarly, ¾ tone above B would be C𝄳 (C-*sori*) because the interval B-C is a ½-step. Because each whole tone can be divided into four intervals, we get five different main sizes of seconds and three sizes of thirds:

m2, **N2**, **M2**, **NA2** and **A2**, respectively **m3**, **N3**, and **M3**.

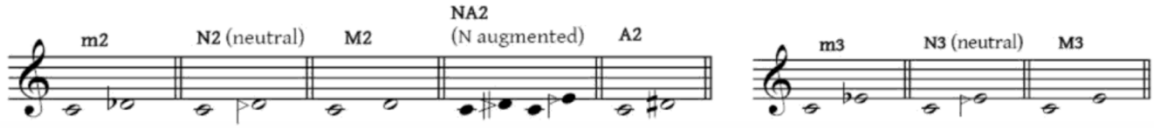


Figure 2. Discussion of the proposed characters, from Rechberger 2018, page 114.

was taken to his home, in a mountain village in the suburb of Tehran, by his devoted disciple Ruhollah Xāleqi, who had become a close friend of mine during the period when I conducted my early research on Persian music. Vaziri was 72 at the time, and I found him to be far more vigorous and lucid than any other musician I had interviewed.

Although Vaziri's theoretical views must be unequivocally refuted, the importance of this musician in the twentieth-century developments of Persian music cannot be overestimated. He was a man of unquestionable integrity and his devotion to the 'cause' of Persian music, as he saw it, was boundless. His innovations in the notation of Persian music have become the standard and, in the present book, I have used the two signs *koron* (𝄢) and *sori* (𝄲) which he invented to indicate the microtonal lowering and raising of tones, although, as used by him and his school, they are meant to lower and raise a pitch by an exact quarter-tone.

Figure 3. Discussion of the proposed characters, from Farhat 2004, page 10.

"Quarter tone" of the Persian Music

Now, let us consider the intervals used in the traditional Persian music in comparison with the theory of Pythagoras. In traditional music of Iran, in addition to the tone and semi-tone, there exist other intervals which are slightly different, and are referred to as "quarter tones" (in fact, these intervals are slightly smaller than the semi-tone and this difference is referred to as "quarter tone").

During the first decades of the 20th century, Ali-Naqi Vaziri, a prominent Iranian musicologist, tried to formulate a theory through generalization of equal-tempered scale and asserted that it is exactly $\frac{1}{4}$ of a "whole tone" (in equal-tempered scale). He considered the signs 𝄳 (Koron) and 𝄲 (Sori), respectively, for "a quarter tone before" and "a quarter tone after":

Re(b) Do(#) Re(𝄳) Re Re(𝄲) Mi(b) Re(#)

But the theory is not verified by experimental measurements. In fact, the measurements performed by Sāsān Sipantā (1998) and Hormoz Farhat (1990) revealed that 𝄳 and 𝄲 are approximately equal to 3 and 2 commas. Sipantā (1998) and Farhat (1990)

Figure 4. Discussion of the proposed characters, from Damadi and Seraji 2011, page 387.

Glossary of Symbols and Terms

Symbols

𝄳: *koron*; symbol for half-flat, approximately 1/4 tone. This symbol was introduced by Ali Naqi Vaziri (1887–1979).

𝄲: *sori*; symbol for half-sharp, approximately 1/4 tone (introduced by Ali Naqi Vaziri.)

𝅘𝅥: *rāst*; playing with right hand.

𝅘𝅥: *chap*; playing with left hand.

X: *juft*; right and left hands simultaneously.

∪ : short syllable.

– : long syllable.

Figure 5. Definition of the proposed characters in a glossary, from Azadehfar 2011, page 345.

Chahārgāh: one of seven *dastgāh-ha* in contemporary Iranian music; its primary scale is C D𝄭 E F G A𝄭 B C.

Chahārmeẓrāb: four strokes; an instrumental genre of compositions with fixed-metre.

Chakām (also in form of *chakāmak):* love-lyric or romantic story in the Sasanian period (224-651).

Chang: harp.

Dānish Nāmeh Alā'ī: book by Ibn Sīnā (Avicenna 974-1037) in Persian which contains one chapter in music.

Darāmad: introduction; first *gūsheh* in every *dastgāh* or *āvāz*.

Dasātīn: (pl. of *dastān*), see *dastān*.

Dashtī: one of the major subdivisions of *dastgāh Shūr*; one of the five *āvāz-ha* of Iranian classical music; its primary scale is G A𝄭 B♭ C D(𝄭) E♭ F G.

Figure 6. The proposed symbols used in defining two *dastgāh*s, *Chahārgāh* and *Dashtī*, from Azadehfar 2011, page 348.

from the earlier theory. Accordingly, if we use the current Persian symbols *koron* (𝄭) and *sori* (♯) to indicate, respectively, a lowering or raising by an approximate quartertone, the intervallic values of the *G - g* rast scale of Cantemir's day can be represented as:

G	*A*	*B*𝄭	*c*	*d*	*e*	*f*♯	*g*
1	2	3𝄭	4	5	6	7𝄭	1'

and assuming that the secondary notes flanking 3𝄭 and 7𝄭 are approximately a quartertone higher or lower (and therefore a semitone below or above the next main note) we arrive at:

1 2 3♭ 3𝄭 3 4 5 6 7♭ 7𝄭 7 1'

where the divided whole tones, e.g. 2 - 3 (*A - B*) or 3♭ - 4 (*B*♭ *- c*), consist of a semitone and two quartertones, in the first case ascending, in the latter descending.

These values seem relatively secure. Problems arise, rather, with the other wholetones where there are two internal divisions, for here values are less easy to establish. In the case of *G - A* we are offered both a secondary note below *A*, called zengüle, and a hypothetical note above *G*, but when we turn to, say, *c - d* and *d - e* there appears to be nothing hypothetical about the existence of a secondary note above *c*, called saba, alongside another below *d*, called uzzal, or of a secondary note above *d*, called beyati, alongside another below *e*, called hisar. It might be thought, by analogy, that, say, the series *c* - saba - uzzal - *d* and *d* - beyati - hisar - *e* should correspond either to 1 2♭ 2𝄭 2[57] or, conceivably, to 1 1♯ 2♭ 2:

1	2♭	2𝄭	2
c	*d*♭	*d*𝄭	*d*
d	*e*♭	*e*𝄭	*e*

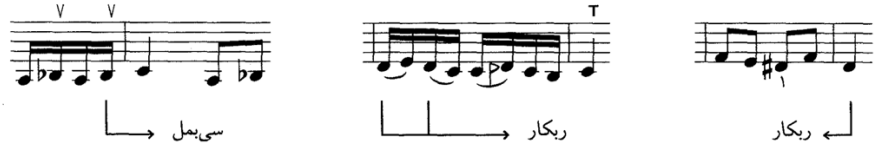
1	1♯	2♭	2
c	*c*♯	*d*♭	*d*
d	*d*♯	*e*♭	*e*

but there is little evidence to support such a view, and more that runs counter to it.[58]

Figure 7. The proposed symbols used in Wright 2017, page 18.

بِمُل[۱] ♭ : صدای نت را نیم پرده بم می‌کند.
کُرُن[۲] 𝄫 : صدای نت را ربع پرده بم می‌کند.
بِکار[۳] ♮ : صدای اصلی (صدای تغییریافته را به حالت قبل برمی‌گرداند)
دی‌یِز[۴] ♯ : صدای نت را نیم پرده زیر می‌کند.
سُری 𝄲 : صدای نت را ربع پرده زیر می‌کند.

این علامت‌ها در سمت چپ نت نوشته می‌شوند و صدای نت را به اندازه‌ی تعریف‌شده، بم یا زیر می‌کنند. این علامت‌ها روی تمام نت‌های همنامِ بعد از خود، تا آخرِ همان میزان تأثیر دارند ولی در میزانِ بعد اعتباری ندارند و در صورت لزوم باید تکرار شوند. به مثال‌های زیر توجه کنید:



علامت ترکیبی: روش دیگر نوشتن علامت‌ها به این صورت است که در اول قطعه بعد از کلید و قبل از کسر میزان نوشته می‌شوند و در این صورت، علامت‌ها روی تمام قطعه و در تمام اکتاوها تأثیر دارند.

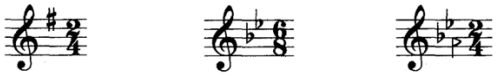
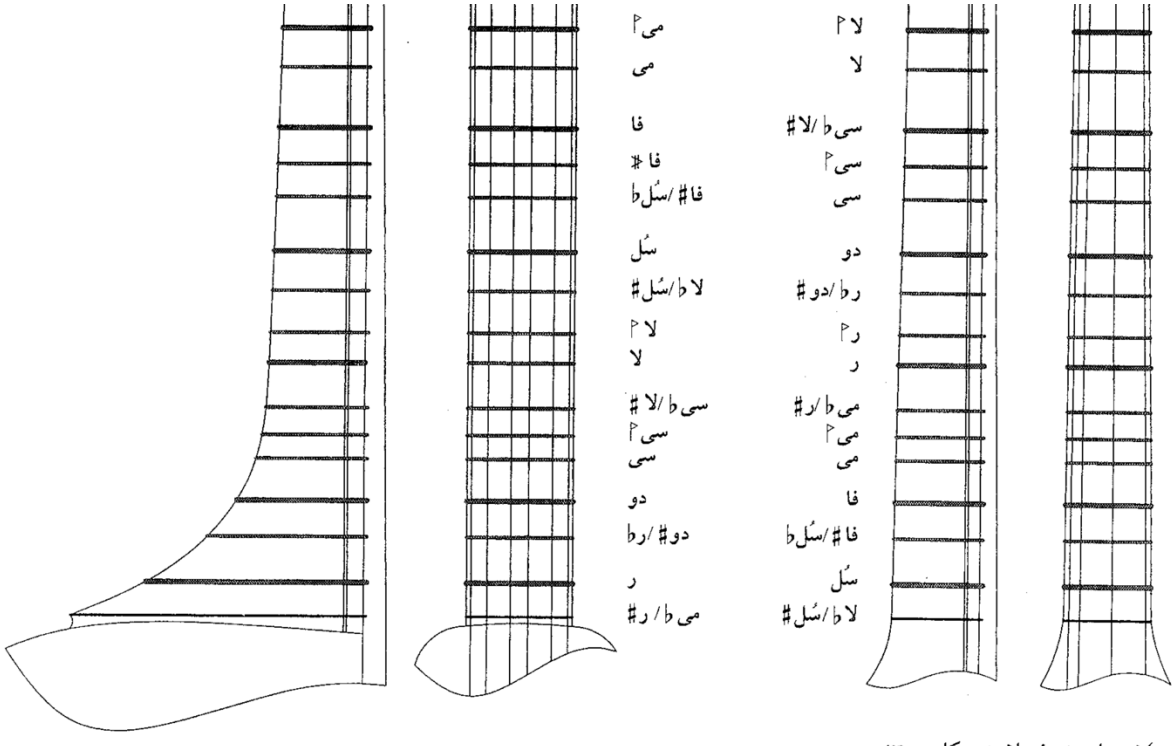
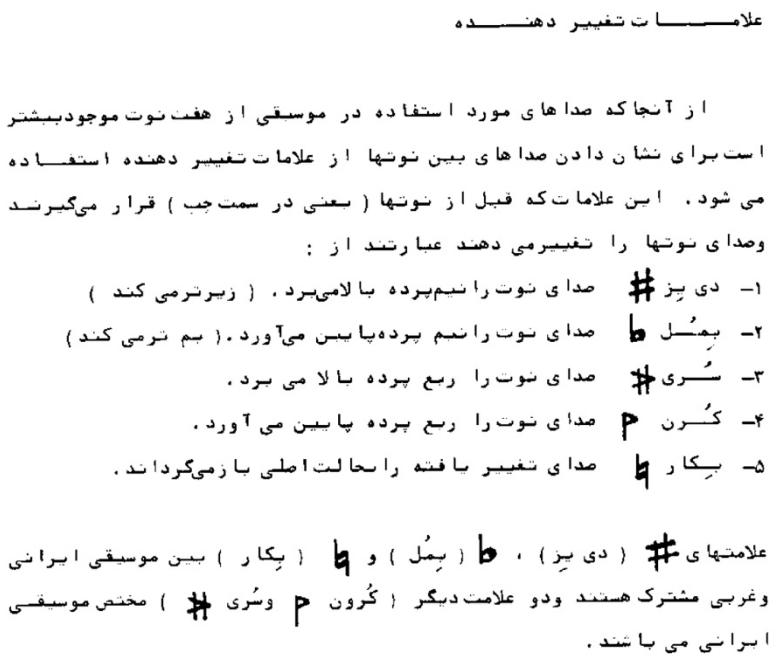


Figure 8. The proposed symbols defined and used in Ma'roufi and Zarrinpanjeh 2007, page 12.



*) نت‌های بدون علامت، بکار هستند.

Figure 9. The proposed symbols used to describe finger positions for *tār* and *setār* in Ma'roufi and Zarrinpanjeh 2007, page 14.



علامـــــات تغییر دهنـــــده

از آنجاکه صداهای مورد استفاده در موسیقی از هفت نوت موجودبیشتر است برای نشان دادن صداهای بین نوتها از علامات تغییر دهنده استفـــاده می شود. این علامات که قبل از نوتها (یعنی در سمت چپ) قرار میگیرند وصدای نوتها را تغییرمی دهند عبارتند از :

۱- دی یز # صدای نوت را نیم‌پرده بالامی‌برد. (زیرترمی کند)

۲- بِمُـل ♭ صدای نوت را نیم پرده‌پایین می‌آورد. (بم ترمی کند)

۳- سُـری # صدای نوت را ربع پرده بالا می برد.

۴- کُـرن 𝄫 صدای نوت را ربع پرده پایین می آورد.

۵- بِـکار ♮ صدای تغییر یافته را بحالت اصلی بازمی‌گرداند.

علامتهای # (دی یز)، ♭ (بِمُل) و ♮ (بِکار) بین موسیقی ایرانی وغربی مشترک هستند ودو علامت دیگر (کُرون 𝄫 وسُری #) مختص موسیقـی ایرانی می باشند.

Figure 10. The proposed symbols defined in Zolfonoun 1990, page 27.

راهنمای علامات بکار رفته در نت نویسی ردیف برای تار

علامـــات تغییردهنده

دیِز : این‌علامت هرگاه قبل‌ازنوتی واقع‌شود نیم‌پرده صدای‌آن‌نوت را بالا میبرد (زیرمیکند) .

بِمُل : این‌علامت هرگاه قبل‌از نوتی واقع شود نیم‌پرده صدای‌آن‌نت را پائین‌تر میبرد (بم‌میکند) .

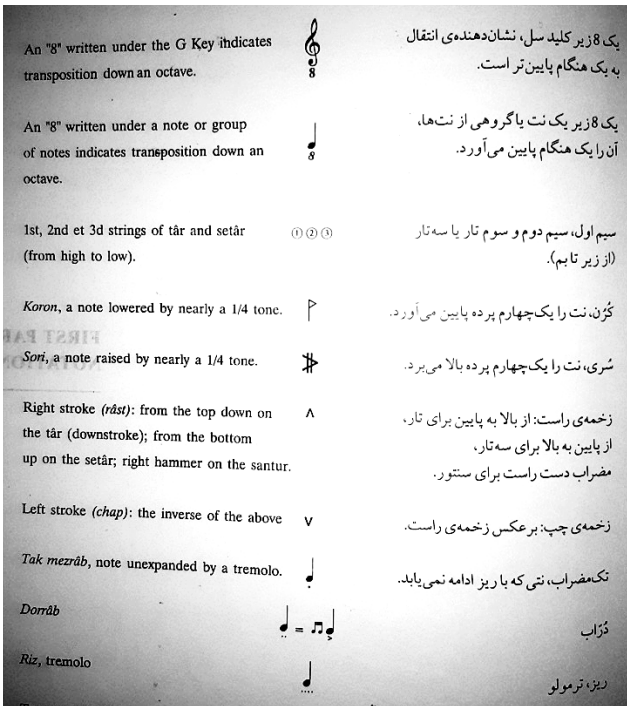
بِکار : این علامت نوت تغییر یافته را بحالت اصلی وطبیعی برمیگرداند .

کُرن : این علامت نوت را ربع پرده وبمقدار حقیقی بمیزان یك لیما بم میکند (مخصوص موسیقی ایران است) .

سُری : این علامت نوت را ربع پرده وبمقدار حقیقی بمیزان یك‌کما بالا میبرد (مخصوص موسیقی ایران است) .

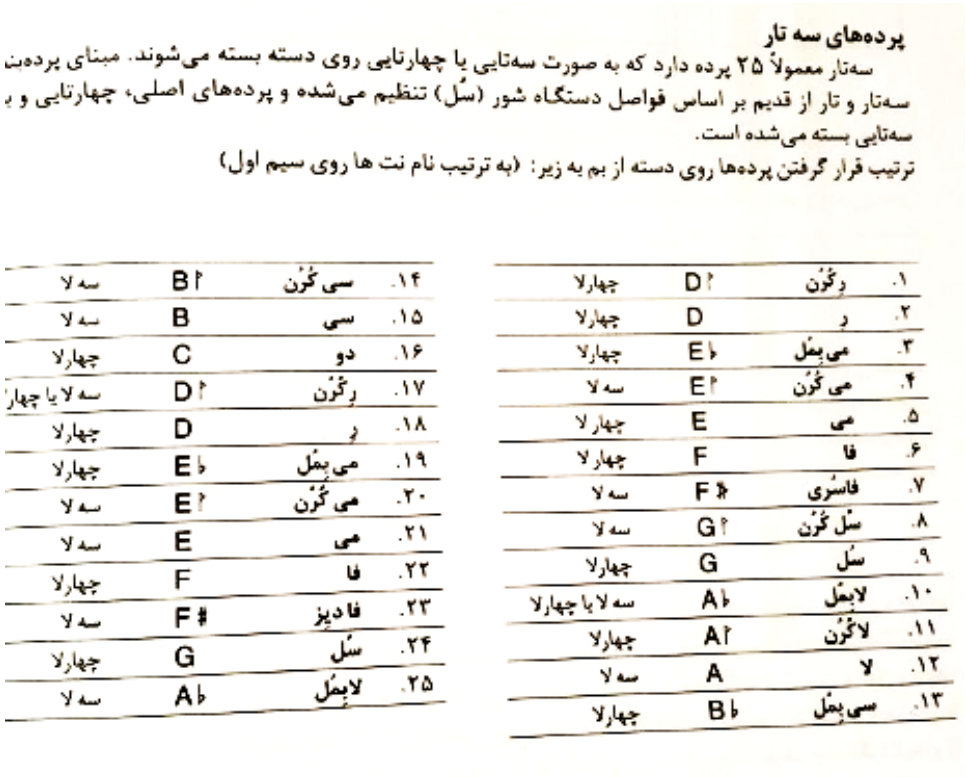
علامـــات تغییردهنده را چنانچه در ابتدای جملهٔ موسیقی پس‌از کلید بگذارید در تمام آن‌جمله حکومت مینماید مثلاً چنانچه روی خط سوم بِمُل باشد نوت سی درتمام آن‌جمله بِمُل خواهدبود وچنانچه هریك ازاین علامات بطور عرضی با اتفاقی یافت شود مثلاً درمیزانی‌دو دیِز شود فقط درهمان میزان نوتهای‌دو بحکم نوت‌اول که دیز شده خواهند بود ودرمیزان بعد تأثیری ندارد ولی‌درآوازهای ایرانی چون بدون ضرب نوشته میشود چنانچه

Figure 11. The proposed symbols defined in Ma’roufi 1973.



An "8" written under the G Key indicates transposition down an octave.	𝄞₈	یک 8 زیر کلید سل، نشان‌دهنده‌ی انتقال به یک هنگام پایین‌تر است.
An "8" written under a note or group of notes indicates transposition down an octave.	♩₈	یک 8 زیر یک نت یا گروهی از نت‌ها، آن را یک هنگام پایین می‌آورد.
1st, 2nd et 3d strings of târ and setâr (from high to low).	① ② ③	سیم اول، سیم دوم و سوم تار یا سه‌تار (از زیر تا بم).
Koron, a note lowered by nearly a 1/4 tone.	𝄢	کُرُن، نت را یک‌چهارم پرده پایین می‌آورد.
Sori, a note raised by nearly a 1/4 tone.	𝄪	سُری، نت را یک‌چهارم پرده بالا می‌برد.
Right stroke *(râst)*: from the top down on the târ (downstroke); from the bottom up on the setâr; right hammer on the santur.	∧	زخمه‌ی راست: از بالا به پایین برای تار، از پایین به بالا برای سه‌تار، مضراب دست راست برای سنتور.
Left stroke *(chap)*: the inverse of the above	∨	زخمه‌ی چپ: برعکس زخمه‌ی راست.
Tak mezrâb, note unexpanded by a tremolo.	♩	تک‌مضراب، نتی که با ریز ادامه نمی‌یابد.
Dorrâb	♩ = ♫	دُرّاب
Riz, tremolo	♩	ریز، ترمولو

Figure 12. The proposed symbols defined in Mirza Abdollah 2006, page 8.



پرده‌های سه تار

سه‌تار معمولاً ۲۵ پرده دارد که به صورت سه‌تایی یا چهارتایی روی دسته بسته می‌شوند. مبنای پرده‌بن
سه‌تار و تار از قدیم بر اساس فواصل دستگاه شور (سُل) تنظیم می‌شده و پرده‌های اصلی، چهارتایی و ب
سه‌تایی بسته می‌شده است.

ترتیب قرار گرفتن پرده‌ها روی دسته از بم به زیر: (به ترتیب نام نت ها روی سیم اول)

۱.	رِکُرُن	D♭	چهارلا
۲.	رِ	D	چهارلا
۳.	می بِمُل	E♭	چهارلا
۴.	می کُرُن	E♮	سه لا
۵.	می	E	چهار لا
۶.	فا	F	چهار لا
۷.	فاسُری	F♯	سه لا
۸.	سُل کُرُن	G♮	سه لا
۹.	سُل	G	چهارلا
۱۰.	لابِمُل	A♭	سه لا یا چهارلا
۱۱.	لاکُرُن	A♮	چهارلا
۱۲.	لا	A	سه لا
۱۳.	سی بِمُل	B♭	چهارلا

۱۴.	سی کُرُن	B♮	سه لا
۱۵.	سی	B	سه لا
۱۶.	دو	C	چهارلا
۱۷.	رِکُرُن	D♮	سه لا یا چهار
۱۸.	رِ	D	چهارلا
۱۹.	می بِمُل	E♭	چهارلا
۲۰.	می کُرُن	E♮	سه لا
۲۱.	می	E	سه لا
۲۲.	فا	F	چهارلا
۲۳.	فا دیز	F♯	سه لا
۲۴.	سُل	G	چهارلا
۲۵.	لابِمُل	A♭	سه لا

Figure 13. The proposed symbols used to define finger positions for *setār* in Alizadeh 2017, page 15.

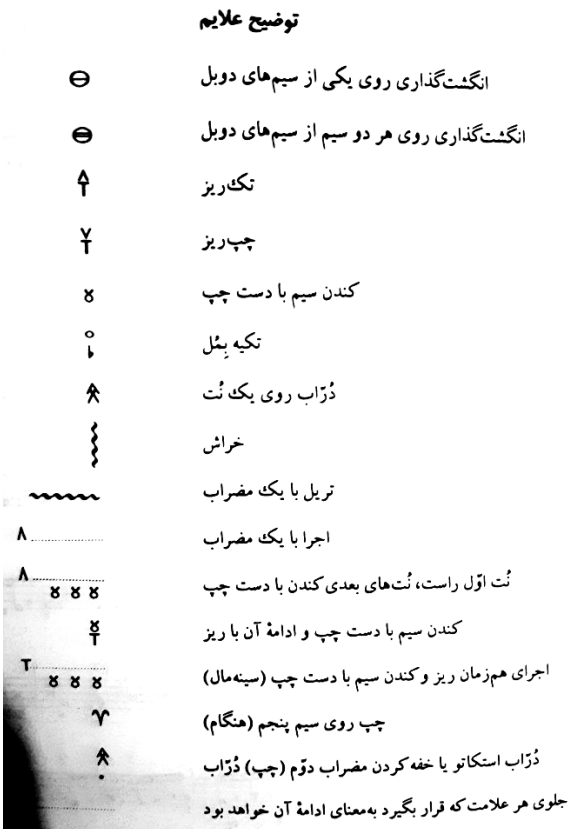


Figure 14. A symbol list from Alizadeh 1996. Most of these are not encoded in Unicode either, but need further research before being proposed.

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

A. Administrative

1. Title**: *Proposal to encode two accidentals for Iranian classical music***
2. Requester's name: **Roozbeh Pournader**
3. Requester Type: **Expert Contribution**
4. Submission date: **April 23, 2020**
5. Requester's reference, if applicable: **N/A**
6. Choose one of the following:
   This is a complete proposal: **Yes**
   (or) More information will be provided later: **No**

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): **No**
      Proposed name of script: **N/A**
   b. The proposal is for addition of character(s) to an existing block: **Yes**
      Name of existing block: **Musical Symbols**
2. Number of characters in proposal: **2**
3. Proposed category: **A-Contemporary**
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? **Roozbeh Pournader**
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): **Roozbeh Pournader**
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 endorse information)? **Yes.**

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 http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://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? **No**
   If YES explain: **N/A**
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? **The authors are part of the user community**
   If YES, available relevant documents: **N/A**
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? **Yes**
   Reference:
4. The context of use for the proposed characters (type of use; common or rare): **Common**
   Reference:
5. Are the proposed characters in current use by the user community? **Yes**
   If YES, where? **In publications about Persian music**
   Reference:
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? **N/A**
   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? **N/A**
   If YES, reference: **N/A**
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? **N/A**
   If YES, reference: **N/A**
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? **Yes**
    If YES, is a rationale for its inclusion provided? **Yes. They are similar in function to U+1D132 and U+1D133, but are very different in appearance.**

If YES, reference: **N/A**

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? **N/A**

If YES, reference: **N/A**

Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? **N/A**

If YES, reference: **N/A**

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): **N/A**

13. Does the proposal contain any Ideographic compatibility characters? **No**

If YES, are the equivalent corresponding unified ideographic characters identified? **N/A**

If YES, reference: **N/A**