

Ponomar Project
Slavonic Computing Initiative

Proposal to Encode Znamenny Musical Notation in Unicode

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April 17, 2019

The authors request the addition of a new block, entitled Znamenny Musical Notation, to the Unicode Standard for the consistent computer representation of the characters used to record Znamenny Chant and related forms of liturgical music. A block of 208 codepoints in the Supplemental Multilingual Plane is requested. The remainder of this document describes the writing system, its character repertoire, and the encoding principles.

1 Description of Writing System

Znamenny Chant is a form of unison, melismatic, liturgical singing that developed in Kievan Rus sometime in the 11th century [1, p. 58]. Until the rise of Western musical influence in the late 17th century, Znamenny Chant was the predominant form of liturgical music used in Russia and Ukraine. Following the 17th century, it remained in use by Russian Old Ritualists as well as some monasteries and parishes within the mainline Russian Orthodox Church. In recent years, beginning with the work of musicologists and liturgiologists in the late 19th century, Znamenny Chant has also become the subject of academic research [2, pp. 8-46].

Traditionally Znamenny Chant is recorded using a neumatic musical notation system (in other words, a musical notation system that does not use a lined staff) called Znamenny Notation, or Stolp (“systematic”) Notation, also known, by the characteristic shape of its symbols, as Kryuki (“hooks”)². While derived from a form of early Byzantine musical notation called Coislin notation [3, ch. 11][4, ch. 3], Znamenny Notation underwent a lengthy period of development over the course of five centuries, and came to form an absolutely unique writing system, graphically and theoretically distinct from the Byzantine Music Notation already encoded in Unicode.

1.1 Classification

Modern Znamenny Notation can be grouped into three varieties, which, following Gardner [5], we call Types A, B and C. The earliest of these is the Type C Notation, which occurs in musical manuscripts from the 15th century onward and lacks any markings indicating pitch. We present an example of this notation in Figure 1. In the first half of the 17th century, special marks indicating pitch and dynamics

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²The term “Znamenny Notation” is a tautology, the word “znamenny” meaning “notational” in Church Slavonic; nonetheless, this term has become widely accepted in the literature.

Figure 1: Example of Type C Notation. Source: *Sticherarion*, beginning of the 16th century; Russian State Library, coll. 304.I, ms. #411.

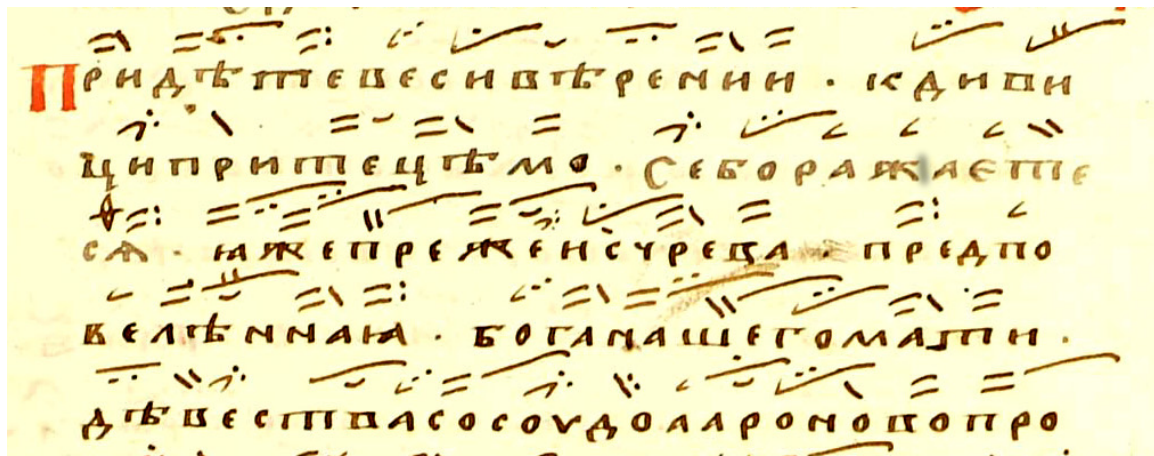
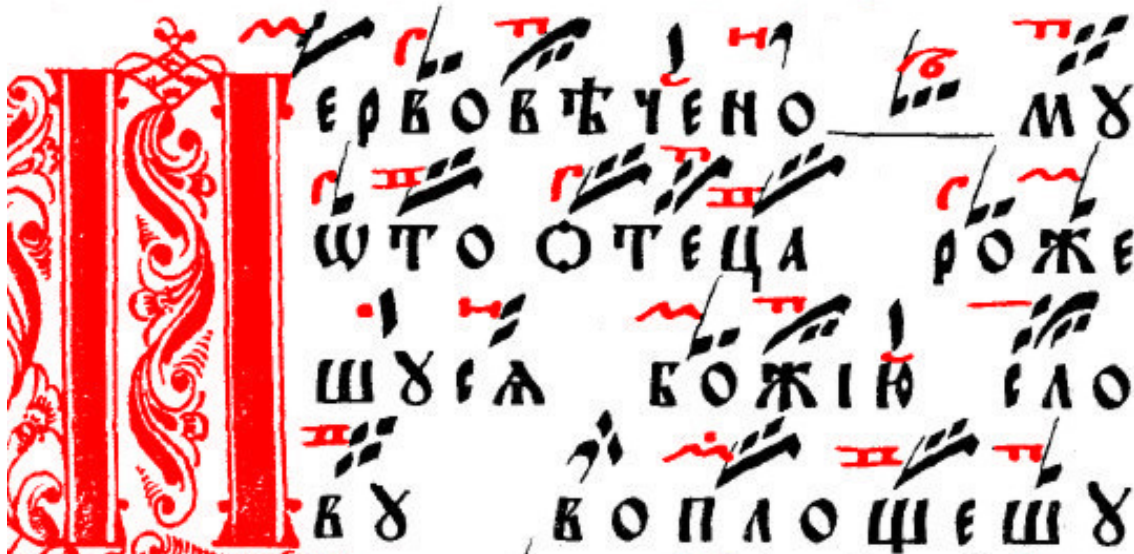


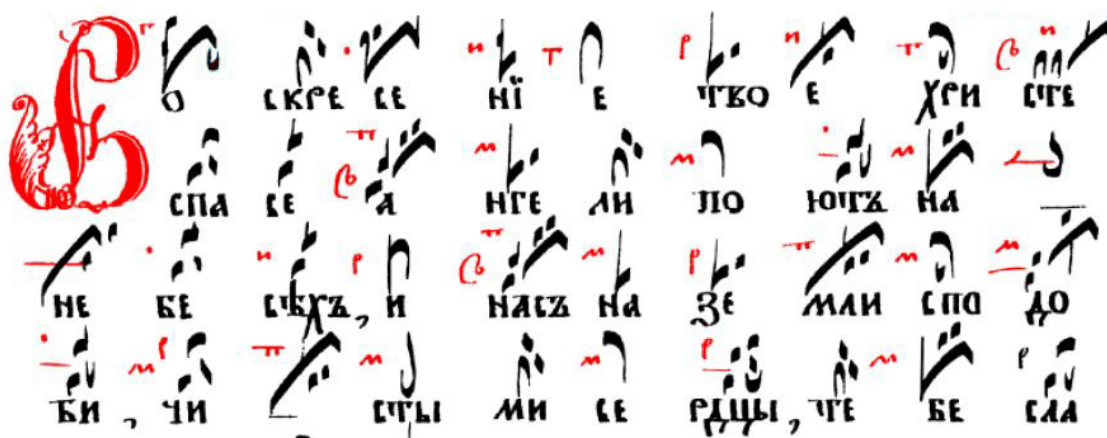
Figure 2: Example of Type B Notation. Source: *Octoechos*. Moscow, 1913–1914.



were introduced; these markings make use of combining stylized lowercase Cyrillic letters and other symbols, which are added to the base neume. The marks are made in red ink, and are thus called Cinnabar Marks or Shaidur Marks, after a certain Ivan Shaidur, who was credited with creating the system. Manuscripts from 1600 to about 1650 may make use of a variety of such Cinnabar Marks, and several potentially competing systems may have existed at one time. We propose for encoding primarily the system of marks that is explained in the 1670 treatise *Izveshchenie o soglasneyshikh pometakh* by Aleksandr Mezenets and has become standard since then. We also propose for encoding some characters from earlier marking systems, but, since the earlier systems have not been adequately researched, we are presently unable to propose a complete repertoire; in any case, these additional markings are of interest only to a narrow group of specialists [6, pp. 96-141][7]. We call Znamenny Notation bearing any kind of Cinnabar Marks Type B Notation. We present an example of this notation in Figure 2.

In the late 17th century, the need arose for typesetting Znamenny Notation on the printing press. Since contemporary type technology did not allow for the simultaneous printing of neumes in black and

Figure 3: Example of Type A Notation. Source: *Octoechos*. Moscow, 1913.



red ink, a monochrome system of alternative pitch marks was devised. This system uses small dashes (called *priznaki*) located in various places on the neume for the indication of pitch. The system was also standardized by Mezenets in the *Izveshchenie* [6, pp. 143-164]. For a variety of reasons, Znamenny chantbooks did not make it to press until the 20th century, when the problem of color became a non-issue. The *priznaki*, nonetheless, became widely accepted, and came to be used in manuscripts alongside the Cinnabar Marks³. Notation bearing both the *priznaki* and the Cinnabar Marks we call Type A Notation. We present an example of this notation in Figure 3.

Aside from the use of a system for indicating pitch, the character repertoire of Type A, B and C Notations is nearly identical. Certain visual differences in the appearance of neumes are insignificant, and best handled at the font level. Thus, all three systems form one unified writing system.

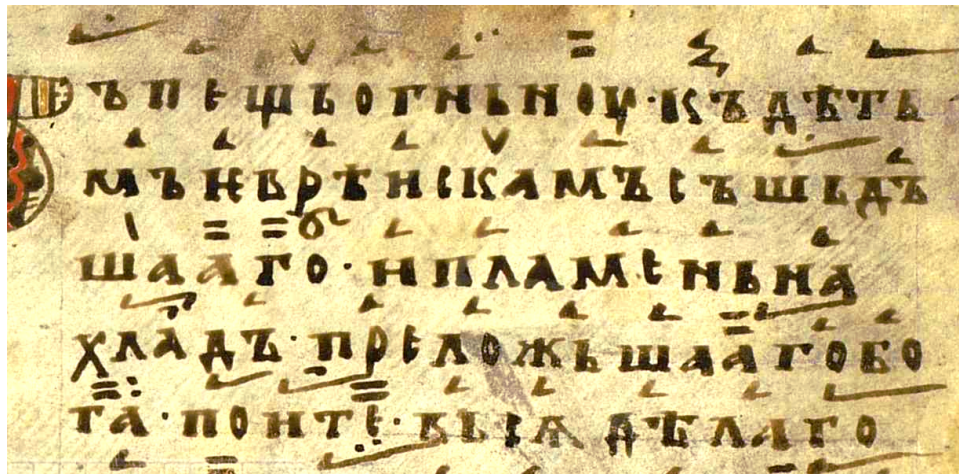
1.2 Archaic Znamenny Notation

In addition, we also consider Znamenny Notation of the earliest period, which occurs in manuscripts dating from the 11th to the 14th centuries. Such sources include additional archaic neumes, which went out of use during the liturgical and musical reforms of the 15th century [8, pp. 120-125]. The determination of the full character repertoire of this archaic system is more difficult, given that no systematic catalog of characters has remained from the time period (the earliest Znamenny catalogs that have come down to us date only to the 15th century [9]). Thus, to establish the repertoire of characters, we have analyzed some of the musical manuscripts characteristic of the era, both published (see [10], [11], [12], [13], [14]) and unpublished. We present an example of Archaic Znamenny Notation in Figure 4.

An analysis of this character repertoire reveals that archaic characters may be grouped into families together with the characters of modern Znamenny Notation based on their main graphical features [15, esp. p. 30.]. Many of these characters should be treated as identical to their later analogs, and any graphical distinctions should be handled at the font level. A number of additional archaic characters are also encountered; these include especially the “hook-based arrows” (*kryukovye strely*), which ceased to be used in the notation system in the 15th century, as well as a number of additional “arrows” with various bases. We propose for encoding also the main forms of these characters. Since no catalogs of neumes have come down from this period, no names for these characters exist. We use the hypothetical

³This is in fact a pleonasm, as the Cinnabar Marks and the *Priznaki* indicate the same thing and the latter were invented to replace the former.

Figure 4: Example of Archaic Znamenny Notation. Source: *Hirmologion*, 12th century; Russian State Archive of Ancient Documents, coll. 381, ms. #150.



names that have been proposed by researchers in this field, for example, in the works of Smolensky [10, p. 15]. Sometimes we are forced to introduce new names that serve to graphically describe the character.

In addition to archaic Znamenny Notation, the earliest period of Slavic music is marked by the use of another notational system called Kondakarian Notation [16]. This system uses a character repertoire that is distinct from Znamenny Notation. The authors plan to submit a separate proposal for the encoding of Kondakarian Notation symbols.

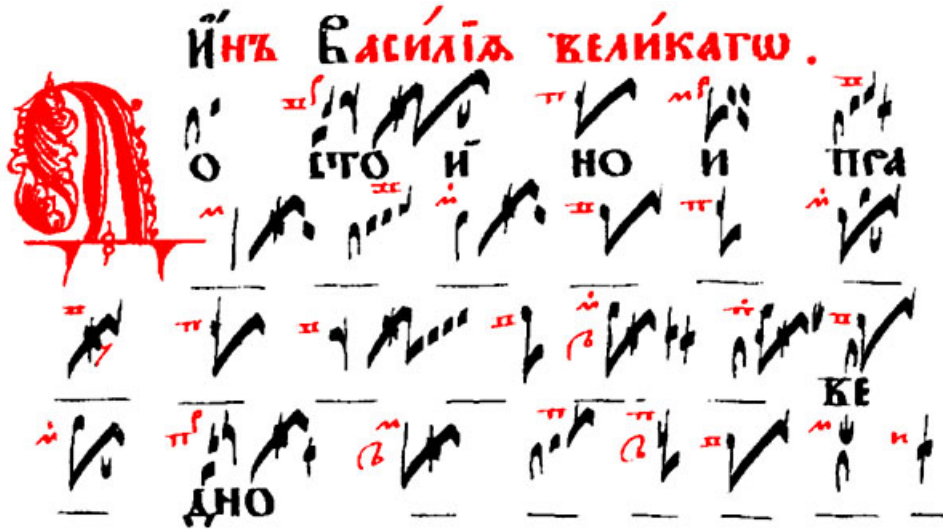
1.3 Demestvenny / Put Notation

Starting with the late 15th century and through the end of the 17th century, a number of forms of melismatic vocal music flourished in Russia side-by-side with Znamenny Chant, but with a more limited repertoire. These forms of chant, which also included forms of polyphony quite distinct from the Western-style harmonized chant that emerged at the end of the 17th century, went by a variety of names, including Demestvenny Chant, Put Chant and [Multiple] Lined Polyphony (*strochnoe mnogogolosie*). This style of music largely went out of use at the end of the 17th century, though Demestvenny Chant (in only its monophonic form) continued to be cultivated in the 18th and 19th centuries among the Russian Old Ritualist communities.

This form of music has been recorded with a special form of neumatic musical notation, which scholars have called by a variety of names, including Demestvenny Notation [18, p. 265], Put Notation [5, p. 456] and Kazan Notation [1, p. 184]. It is now generally accepted that all of these terms refer to one notational system derived from Znamenny Notation through the addition of supplementary neumes and a number of other features [17]. This notational system first appeared in manuscripts in the late 16th century, went out of use in the mainline Russian Orthodox Church at the end of the 17th century, but continues to be used by Old Ritualists today, especially in two chantbooks, the *Demestvennik* and the *Obednitsa* [19, pp. 53-67]. An example from the *Obednitsa* is presented in Figure 5. We present another example of this notation from a 17th century manuscript of Put Chant in Figure 6. The typesetting of these materials on the computer is also of interest to musicologists; we present an example of Kazan Notation used in academic writing (due to a lack of an encoding scheme, the neumes were rendered graphically) in Figure 7.

Since Demestvenny / Put Notation shares many neumes with Znamenny Notation, we propose to

Figure 5: Example of Demestvenny / Put Notation (printed). Source: *Obednitsa Znamennogo i Demestvennogo rospeva*, Kiev, 1909.



encode it together with Znamenny Notation as one writing system. Where a neume has a different name in catalogs of Put or Demestvenny neumes, we provide the alternative name in an annotation. We also propose for encoding additional neumes used exclusively in Demestvenny / Put Notation. In assembling the repertoire of such neumes, we have followed [20], [21], [19, pp. 378-400], as well as the catalog (*Azbuka*) of Kalashnikov, published by Old Ritualists in 1911 [22]. No comprehensive catalog of neumes used in Put Notation is available in the academic literature; we have based our repertoire of neumes on a number of existing publications ([23], [24], [17], [25]), as well as manuscript sources.

1.4 Current Usage

Today, Type A Notation and Demestvenny Notation are used by small minorities in the mainline Russian Orthodox Church as well as by the “priested” Old Ritualists and Yedinovertsy (Old Ritualists in communion with the mainline Russian Orthodox Church). Type B Notation is used by Priestless Old-Ritualists (Bezpopovsty). Type C Notation and Archaic Notation are presently not used, but are of interest to musicologists and liturgiologists studying medieval Znamenny Chant manuscripts. Adding all the usage groups together, we estimate that the number of active users of the notation is several hundred thousand worldwide.

1.5 Typesetting the Writing System

The first attempts at printing Znamenny Notation were made in Moscow in 1652, when Fedor Ivanov Popov was ordered to make the technical arrangements for producing Znamenny chantbooks on the printing press [26, p. 194]. The requirement to print neumes in black and red simultaneously proved insurmountable and the project was abandoned. The standardization of *priznaki* as an alternative method for indicating pitch made printing neumes in monochrome possible. In 1671, a project to print the *Hirmologion* – a common chant book used in the Byzantine Rite – was undertaken in Moscow; the movable type for the project was cast, but, for unknown reasons, the project was never carried out [26, p. 209]. In the 18th century, the linear Kievan music notation system (see [27]) replaced Znamenny Notation as the predominant system of notating music in the Russian Orthodox Church, and the corpus of Znamenny

Figure 6: Example of Demestvenny / Put Notation (manuscript). Source: Russian State Library coll. 379, ms. 30 (second half of the 17th century).

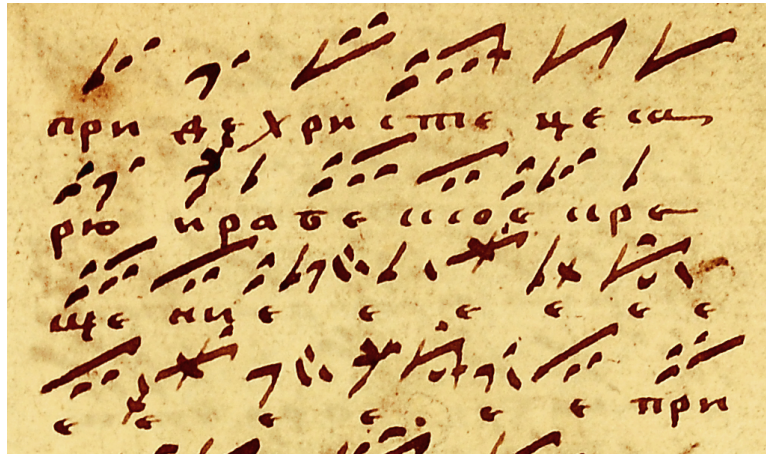










Figure 7: Example of Demestvenny / Put Notation in an academic setting. Source: [17]

В «греческой» нотации обе графические формы верхнего признака всегда имеют только одно описанное выше местоположение. В знаменной нотации признак в виде вертикальчерточки размещается обычно с левой или правой стороны начертания и, таким образом, имеет два местоположения: . Признак в виде толстой черточки также имеет два местоположения: он ставится в середине или сверху вертикальной черты знак: . Последний случай является единственным примером совпадения местоположения признака в знаменной и «греческой» нотациях.

Другое отличие в использовании признаков в рассматриваемых нотациях заключается в том, что все знаки алфавита «греческой» нотации принимают в начертание тот или иной признак, тогда как в знаменном алфавите имеется значительная группа певческих знаков, всегда употребляемых без признаков: сложитие () чашка () голубчик борзый () голубчик тихий () переводка () стрела громная (),

chantbooks was finally printed, but in Kievan notation, in 1772 [2, pp. 135-138]. Znamenny Notation continued to be used in manuscripts produced by Old Ritualists. Only in the early 20th century was the corpus of chantbooks in Znamenny Notation printed by Old Ritualist publishers.

The 20th century also witnessed a growth of academic interest in Znamenny Notation among scholars of liturgy, musicologists, and historians, both in the Soviet Union and among Russian émigrés. Several academic works were published (see, for example, [28], [29], [30], [5], [18]), in which, for a lack of adequate fonts to represent the notation system, Znamenny neumes were hand-drawn or processed graphically.

In recent years, there has been a renewed interest in Znamenny Chant. This has resulted in a variety of resources in Znamenny Notation appearing on the Internet⁴. Since no method for representing the notation exists in any national codepage or international encoding standard, the neumes have been typeset in a variety of formats, either graphically or using *ad hoc* solutions. The most popular approach uses a combination of an *ad hoc* 8-bit codepage, a pre-processing software, and markup language⁵. The multiplication of digital resources for the representation, storage, and processing of Znamenny Chant online makes the encoding of Znamenny Notation in Unicode absolutely essential.

⁴For example: <http://www.znamen.ru/>, <http://dyak-oko.mrezha.ru/>, <http://synaxis.info/>.

⁵See <http://znamen.ru/fmt-znam.htm> (in Russian).

Figure 8: A neume and modifying marks (Type B Notation)

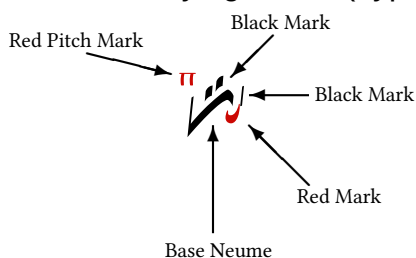
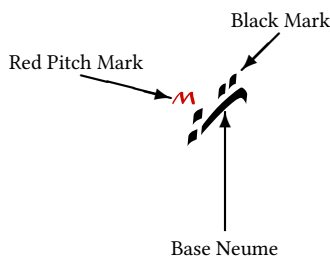


Figure 9: A complex neume and modifying marks (Type B Notation)



2 Proposed Encoding Model












2.1 Base Neumes

The basic building block of Znamenny Notation is the *neume*, a single character consisting of one or more strokes. Unlike the notes used in Common Music Notation (CMN), the neume does not represent precise pitch and duration, but rather indicates a melodic formula. Neumes are recorded from left to right with text (lyrics) recorded underneath the neume. Adjacent neumes may be grouped into larger structures called *melodic kernels* (Slav. *popevki*). The exact musical meaning of a neume is straightforward for some simpler neumes; for the more complex neumes, it may depend on the position of the neume inside a melodic kernel, and on various music-theoretical properties inherited from Byzantine music. In this way, the writing system may be viewed as combining alphabetic and ideographic features.

The base Znamenny neume may be modified by a number of combining symbols (characters) that are placed above, below, to the left of, to the right of, or overlaying the base neume, and are used to indicate pitch, duration, dynamics, or other performance techniques. Some of these characters appear in black type and are called *black modifying marks*. In Type A and Type B Notations, additional such characters appear in red type and are called *red modifying marks* or *cinnabar marks*. The basic structure of a neume and its modifying marks is presented in Figure 8.

The neume in Figure 8 is drawn with a single stroke of the pen, but other neumes may consist of multiple strokes or may even include multiple components. We propose to encode as standalone characters all neumes that are listed and named in traditional catalogs (Slav. *Azbuki*) of Znamenny neumes. In Figure 9, we provide an example of a neume that is drawn using three strokes. The base neume should not be decomposed into its strokes (components), since by themselves these components are not valid characters and have no meaning. The base neumes of the notation systems are proposed for encoding between U+1CF50 and U+1CFC4. The remaining unused positions are reserved for a possible future encoding of additional archaic characters.

Table 1: The use of Tonal Range Marks

| | | | |
|---|---|---|--|
|  |  |  |  |
| <i>Kryuk Mrachny</i> composed as  +  | <i>Statya Mrachnaya</i> composed as  and  or  | <i>Statya Svetlaya</i> | <i>Strela Mrachnaya</i> composed as  and  |

2.1.1 Black Modifying Marks

A number of black modifying marks may attach above, below, or to the right of the main neume. These marks modify the musical meaning of the neume by affecting the duration of notes or adding additional notes to the base meaning of the neume.

In addition, one class of black marks, called *tonal range marks*, is used to indicate pitch. Unlike the red marks discussed below, rather than providing the exact pitch information, these marks only identify a range of possible pitches along the traditional Obikhod Scale (discussed below). We give these marks the names Tonal Range Mark Mrachno (◌̇), Tonal Range Mark Svetlo (◌̈), and Tonal Range Mark Tresvetlo (◌̉); the Tresvetlo Range is usually called *Nepostoyanno* in Put / Demestvenny notation.

Typically, the Tonal Range Marks act like combining characters that position above the main neume, as can be seen in the left panel of Table 1. However, for some neumes, Tonal Range Marks may stack in different ways to form ligatures (see the central panel of Table 1). For the *Skameytsa*, the Tonal Range Marks actually form a part of the main neume and are positioned below the diagonal element. Because the *Skameytsa* can also take additional Tonal Range Marks above the neume, we encode the three varieties of the *Skameytsa* – the *Mrachnaya*, the *Svetlaya*, and the *Tresvetlaya* – as standalone characters. Note that the same Tonal Range Marks are also used as modifying marks for the *Strely* (as can be seen in the right panel of Table 1), though they have a different function, indicating the number of sounds in the *Strela*, rather than the tonal range.

The black marks are proposed for encoding between U+1CF30 and U+1CF40. In order to avoid reordering of the combining marks under the Unicode Normalization Algorithm, we propose to set their Combining Class property to 0. See the section on order of encoding on p. 15 for more details. Note that, despite similar appearance, U+1CF40 Combining Znamenny Mark Kryzh is distinct from U+1CF81 Znamenny Neume Kryzh: U+1CF40 is a diacritical mark, used only in Demestvenny / Put Notation, that either attaches to the base neume (see #63 *Kryuk* with *Kryzh* in Appendix 2) or stacks to the right of a base neume (see #187 *Stopitsa* with *Kryzh* in Appendix 2); U+1CF81 is a base character that functions as a standalone neume (see #59 in Appendix 1, #60 in Appendix 2), sometimes forming a ligature with the previous neume (see #14 in Appendix 1).

2.1.2 Indication of Pitch

Type B and Type A notations use additional red marks (called *Cinnabar Marks* or *Shaidur Marks*) to indicate pitch. The red pitch mark *povyshe* may be observed in Figure 8 and a red pitch mark *malo povyshe* – in Figure 9. The *Cinnabar Marks* are given the traditional pitch names used in Church Slavonic [7, p. 47]. The red marks are proposed for encoding between U+1CF00 and U+1CF0B. In instances where the neumes are typeset in red (for example, when notating polyphony or notating both *Znamenny* and *Demestvenny* Notations), the pitch marks are typeset in black (see Figure 12 for an example).

All of the pitch marks indicate scale degrees along the *Obikhod Scale*, a gamut that provides the series of possible notes used in *Znamenny Chant*. The system is diatonic and consists of four tetrachords,

Figure 10: The Obikhod Scale and Red Pitch Marks

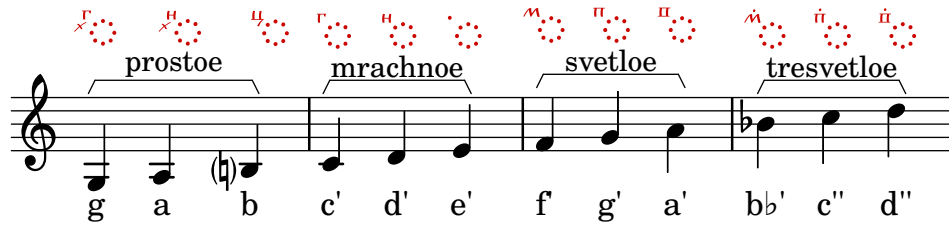
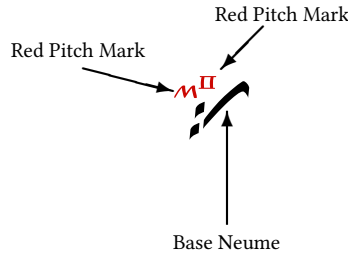


Figure 11: Several red modifying marks along one neume (Type B Notation)



called *soglasiya* (tonal ranges). A fifth tetrachord above the fourth tetrachord is mentioned in the 17th century theoretical treatise *Klyuch Razumeniya*, but is not encountered in practice, and so its pitch marks are not proposed for encoding [31]. By modern convention, the pitch *gorazdo nizko* (indicated using the mark ⦿) is tuned to Middle C. The Obikhod Scale and the red pitch marks are demonstrated in Figure 10.

Multiple red pitch marks may be applied to a single neume, in which case the marks interact typographically and are stacked. The stacking behavior may actually be quite complex and may depend on context; for purposes of simplicity, we propose that by default the marks should stack from left to right, diagonally along the base neume, as illustrated in Figure 11. In some instances, instead of stacking with respect to a previous mark, a secondary pitch mark may attach on the right side of a base neume. This behavior is optional in Znamenny Notation, and is generally used as an explanatory aid for the performer (see the left panel of Figure 12, where the primary pitch mark is indicated with a red arrow, and a secondary pitch mark, attaching on the right, is indicated with a blue arrow). In Demestvenny Notation this behavior is required, and is used to indicate the pitch structure of a complex neume (see the right panel of Figure 12, where the two left-attaching pitch marks, marked by red arrows, stack, while another pitch mark, marked by a blue arrow, attaches on the right). In order to support this functionality, a set of right-attaching pitch marks is proposed for encoding at U+1CF0C to U+1CF17. Consult Appendix 2 for more examples of the usage of right-attaching pitch marks.

Figure 12: Left-attaching (indicated with red arrows) and right-attaching (indicated with blue arrows) pitch marks, as used in Znamenny Notation (on left, source: [32]) and Demestvenny Notation (on right, source: [22])

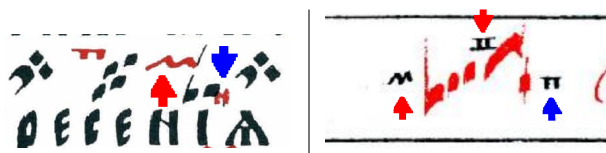


Figure 13: Example of Priznaki



2.1.3 Priznaki in Znamenny and Late Demestvenny Notations

The system of priznaki⁶ was standardized by Aleksandr Mezenets to indicate pitch without the use of cinnabar marks [7]. In this system, the priznaki – tiny markers (narrow slashes or dashes) – are added to the base neume to clarify its pitch within a Tonal Range (tetrachord). We demonstrate the usage of priznaki in Figure 13. For neumes pitched at the first scale degree of a Tonal Range (as indicated by a cinnabar mark[∘], [∘], [∘], or [∘]), no additional mark is added. For neumes pitched at the second scale degree (as indicated by a cinnabar mark[∘], [∘], [∘], or [∘]), a mark is placed on the left or lower part of the neume. For neumes pitched at the third scale degree (as indicated by a cinnabar mark[∘], [∘], [∘], or [∘]), a mark is placed on the right or upper part of the neume. For some neumes, the priznaki may attach to the tonal range markers placed above the neume rather than to the base neume itself.

Priznaki are used only in Type A notation. Moreover, since the placement of both priznaki and cinnabar marks is redundant, the usage of priznaki seems to be somewhat optional in modern typesetting. Encoding separate priznakified versions of each neume would add an unnecessary level of complexity; on the other hand, the system is sufficiently complicated so that the priznaki cannot be invoked from context in a text-only environment. We thus propose to support the priznaki using control characters. We encode two control characters, U+1CF42 Znamenny Priznak Modifier Level 2 and U+1CF43 Znamenny Priznak Modifier Level 3, which are used to indicate the second and third scale degrees, respectively. The presence of a Priznak Modifier indicates that a priznak for the given scale degree should be turned on. The absence of a Priznak Modifier indicates either that a neume is pitched at the first scale degree of a tonal range (which is indicated by an absence of priznaki) or that Type B or Type C Notation is being encoded (where priznaki are not used at all). Software should interpret the Priznak Modifiers as control codes that graphically modify the neume in an appropriate manner. In fonts, this can be handled using glyph substitution via the Glyph Composition (*ccmp*) feature of OpenType.

In Figure 14 we provide examples of how the priznaki are encoded and handled at the font level. Note that the control character must be encoded immediately after the base neume. Appendix 3 provides tables listing the possible combinations of base neumes with priznaki control characters. Demestvenny Notation in the Old Ritualist chantbooks (*Demestvennik* and *Obednitsa*) also uses the system of priznaki found in the Type A Znamenny Notation, thus the priznaki of this notational system are implemented in the same manner.

A second, more advanced system of priznaki appears in a number of Old Ritualist sources such as the *Krug Tserkovnago Drevnyago Znamennago Peniya* published in St. Petersburg in the late 19th century under the patronage of A. Morozov (see, for example, [33, vol. 1, f. 2]). This system employs a finer gradation of the priznaki markers. For neumes that occur in the lower two tonal ranges (the *prostoe* and the *mrachnoe*), the priznaki markers face downward, just as in the system of Mezenets. However, for neumes that occur in the upper two tonal ranges (the *svetloe* and the *tresvetloe*), the direction is flipped and the priznaki markers face upwards. This behavior is demonstrated in Figure 15. Note that priznaki

⁶The Church Slavonic term “priznaki” (sing. “priznak”) is pronounced with the stress on the second syllable, unlike its modern Russian paronym.

Figure 14: Encoding model for Priznaki

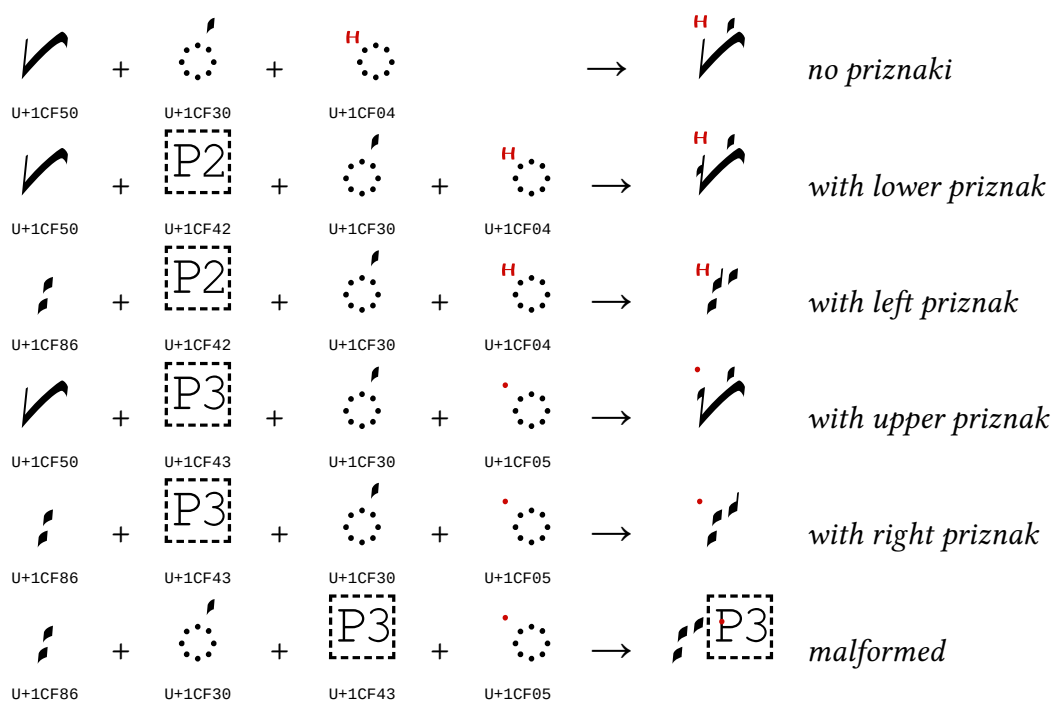


Figure 15: The Usage of Priznaki in the *Krug* of Arseny Morozov



markers only change direction for those neumes where they are positioned along the left vertical beam (for example, the Kryuk and the Stopitsa). The direction of priznaki positioned along the diagonal element does not change, as in the system of Mezenets. In addition to changes in the direction of the priznaki, this system also uses a small underline mark to indicate the lowest tonal range. The mark is either positioned directly below the neume or attaches to the lower part of the neume. The name of this mark is not known, so we call it U+1CF41 Combining Lower Tonal Range Indicator. Note that this mark always appears in black type.

Additionally, in the system of priznaki used in the *Krug*, one character – the Zapyataya – accepts tonal range-specific modifications even when it occurs on the first scale degree of a tonal range (where priznaki are not used). In the *svetloe* tonal range, it receives a rightward-facing priznak, and in the *tresvetloe* tonal range, the shape of the neume itself is modified. This usage of the Zapyataya is demonstrated in Figure 16, along with the proposed encoding methodology.

The usage of separate control characters for the system of priznaki as given in the *Krug* of Morozov seems to be impractical, as it would require encoding four additional control characters: two for the Level 2 and Level 3 “flipped” versions of the priznaki occurring in the *svetloe* and *tresvetloe* tonal ranges, and two more for accessing the variant forms of the Zapyataya and its derivative neumes. Instead, we propose to encode one additional control character, U+1CF44 Znamenny Priznak Modifier Direction Flip, which acts to change the direction of a priznak. The presence of this character, entered immedi-

Figure 16: The Zapyataya with Different Priznaki in the *Krug*

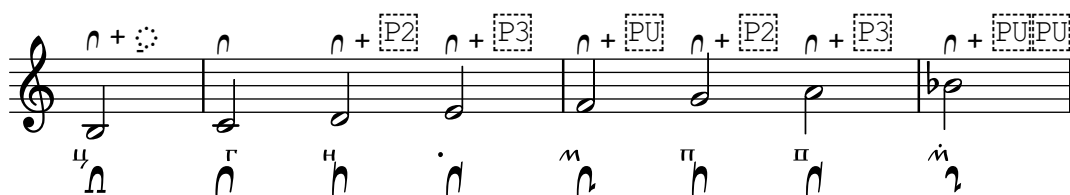
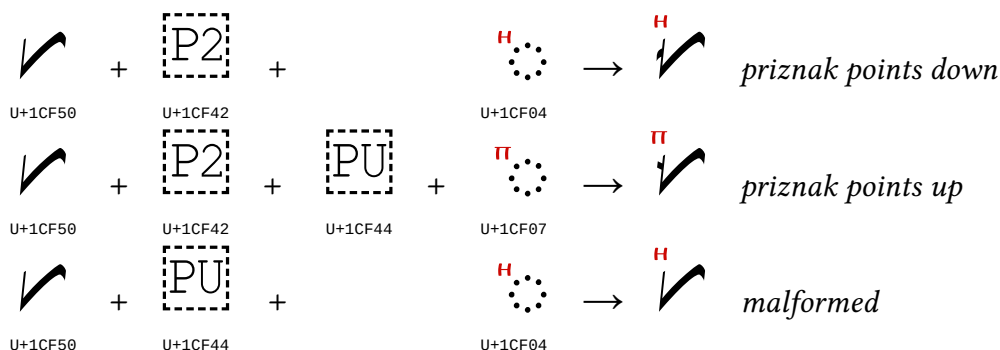


Figure 17: Encoding model for Priznaki as used in the *Krug*



ately following one of the two priznak Level Modifiers, informs the rendering system that the direction of the priznak on the neume needs to be pointed upward. The presence of this character entered immediately following the Zapyataya indicates that the version of the Zapyataya without priznaki needs to be rendered in the shape used in the *svetloe* or *tresvetloe* tonal ranges (see again Figure 16). The benefit of this approach is that a one-to-one relationship is maintained between the pitch level within a tonal range and the presence of Priznak Modifier control characters. The usage of all of these control characters is demonstrated in Figure 17. This usage of two control characters to affect the appearance of priznaki is similar to the use of fill and rotation controls to specify the orientation and appearance of symbols in Sutton SignWriting (see [34, p. 3–5.]).

2.1.4 Priznaki in Kazan Notation

An alternative system of indicating relative pitch was used in early manuscripts of Put Chant (Kazan Notation). This system received its earliest theoretical formulation in the *Klyuch Znamennyoy*, a treatise dated to 1604 [23, p. 117], and was subsequently used in various chantbooks and music theoretical treatises [25]. This system consists of two priznaki: a stylized cross (Slavonic *kryzh*) attached to the left lower part of a neume, which is used to indicate downward vocal movement, and a stylized horn (Slavonic *rog* or *rozhek*) attached to the upper part or diagonal part of a neume, which is used to indicate upward vocal movement. For the support of these priznaki we propose to encode two additional control characters, U+1CF45 Znamenny Priznak Modifier Kryzh and U+1CF46 Znamenny Priznak Modifier Rog, which may be used to indicate to the rendering system that a given neume needs to be drawn with the relevant priznak. One theoretical treatise on Kazan Notation makes a further distinction between a *rog* priznak attached to the left side of the Stopitsa and a *rog* priznak attached to the right side of the Stopitsa [17, p. 261]. We propose to render the right-bearing *rog* priznak by use of the control character Znamenny Priznak Modifier Direction Flip, as described above for the system of priznaki used in the *Krug* of A. Morozov. Note that not encoding the Direction Flip control character would require us to encode an additional character for this one exceptional case. Also note that control characters used for

Figure 18: Priznaki used in Kazan Notation

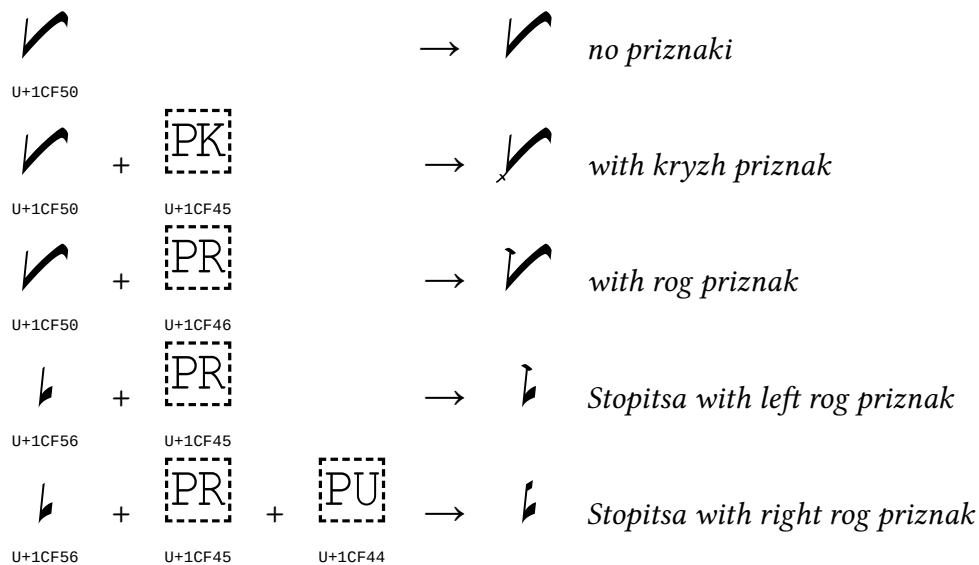


Figure 19: The use of peculiar marks; source: [36, p. 26]. Note the use of a peculiar flat (boxed in red), which lowers the tuning of the pitch and results in a subsequent modulation out of the Obikhod Scale



encoding the prznaki of Type A Znamenny Notation cannot be used to encode prznaki used in Kazan Notation because this would result in ambiguities. The expected behavior of these control characters is illustrated in Figure 18.

2.1.5 Further Modification Marks: ‘Peculiar’ Marks

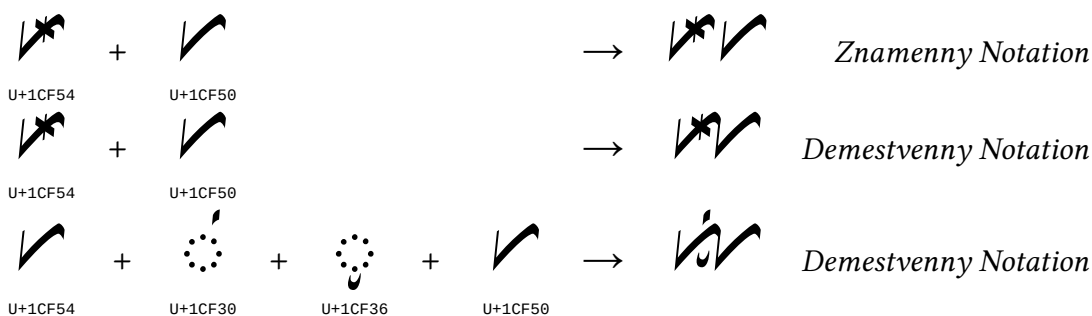
Generally speaking, Znamenny Chanted is executed within the Obikhod Scale. However, some 17th century manuscripts and theoretical treatises do allow for modulation out of the Obikhod Scale. Some modulation out of the Obikhod Scale may also be observed in modern Old Ritualist performance practice. Modulation may be indicated by the use of additional red pitch marks called *strannye pomety* (“peculiar marks”). These markings usually consist of a cinnabar mark with an attached or detached stylized red cross (“peculiar flats”) or a compound mark of a stylized Cyrillic Small Letter Es and a red pitch mark (“peculiar sharps”). See Figure 19 for an example.

It must be recognized that the system of peculiar marks is presently not very well documented or understood. We propose to encode in the range U+1CF10 to U+1CF17 those peculiar marks that are mentioned in the 17th century theoretical treatise *Klyuch Razumeniya* [35]. We also encode a separate combining character U+1CF1F Znamenny Combining Red Mark Kryzh, which may be entered in combination with other red marks to create more peculiar marks.

Figure 20: Use of explanatory marks in Znamenny Notation



Figure 21: The use of ligatures in Demestvenny Notation



2.1.6 Explanatory Marks

Explanatory marks, also called “similarity marks” (*podobnye pomety*) [37, p. 41], are a neume (potentially with modifying marks) or series of neumes set in smaller type and placed above (or sometimes below) a main neume. These explanatory marks are almost always rendered in red. They serve to explain a difficult or unusual musical meaning of the base neume. Since these marks are functionally analogous to ruby, a method used in East Asian scripts to indicate phonetic transcriptions of obscure or unfamiliar ideographs, we propose to use ruby for the representation of Explanatory Marks as well. Ruby annotation may be handled through a variety of existing standards. In plain text contexts where markup is unavailable, a user may use the Interlinear Annotation Characters, U+FFF9 through U+FFFB, to set off explanatory marks (see Figure 20 for an example).

2.1.7 Ligatures in Demestvenny / Put Notation

One additional characteristic feature of Demestvenny Notation is the use of ligatures. A sequence of two, three or four neumes, plus combining black and red marks, may be drawn together, effectively forming a ligature. Since the repertoire of ligated combinations is fixed and the ligatures are largely context-specific, we propose to handle ligatures at the font level using cursive attachment or kerning. Any black or red modifying marks are also attached to the relevant ligature component and positioned at the font level. Font designers may offer precomposed forms of such ligatures in the Private Use Area. The implementation of ligatures is demonstrated in Figure 21 and in numerous examples in Appendix 2.2.

2.2 Character Names and Codepoint Order

All characters in our encoding model are given names according to the standard usage of Znamenny neume catalogs (*Azbuki*). In assembling the repertoire of characters used in modern Znamenny Notation (since the 16th century), we have relied on the listings provided by Razumovsky [1, pp. 269ff], Metallov [38, pp. 32ff], Kalashnikov [39, pp. 10ff] and Ye. Grigor’ev [37, pp. 241ff]. In some instances, neumes may have multiple names or the name used in modern Old Ritualist practice may differ from the historical name or the name used by academics. In such cases, we have specified the alternative

name in the annotations. In all cases, the Church Slavonic names for the neumes and various marks are preserved, but are given in Latin characters using the BGN/PCGN Cyrillic romanization scheme for Russian.

An analysis of historical Znamenny neume catalogs reveals that no two manuscripts agree on the order in which characters are sorted (the “alphabetical order” of the writing system). The only academic attempt to create an alphabetic ordering for Znamenny Notation was proposed by Brazhnikov, but has not been widely accepted [40][41]. We propose the following ordering. First, we place the commonly used neumes following a loose system of radicals. These neumes are: the Kryuk (and same-radical characters Paraklit, Dva v Chelnu, Klyuch, and Zanozhok); the Stopitsa (and same-radical characters Perevodka and Chelyustka); the Palka; the Zapyatya (and same-radical characters Golubchik, Vrakhiya, Derbitsa, and Khamilo); the Chashka and Podchashie; the Skameytsa (all varieties); and, finally, the Slozhitie. Then we place the neumes primarily used for the formation of complex melodic formulæ (called *litsa* and *fity*). These are best placed at this point because the Slozhitie belongs to both the common radical group and the group of neumes used to form complex formulæ. The ordering of the neumes in this grouping is: Kryzh, Rog, Fita, Kobyla, and Zmeytsa.

In the third group, we place all variants of the complex neumes Statya and Strela. The ordering within the group is again based on a system of radicals. Finally, we place complex neumes that have unique functions and appearances. These neumes are almost always placed toward the end of the catalog in the manuscript tradition; they include the Duda, Truba, Nemka and Pauk.

The codepoint order for the base neumes of the notation is thus specified in Figure 22. For the modifying marks, we propose a logical sort order. The red pitch marks are encoded in order of ascending pitch, starting with Gorazdo Nizko s Kryzhem (tuned to g on the Obikhod Scale). Following the red pitch marks, we encode the peculiar marks, also in order of ascending pitch.

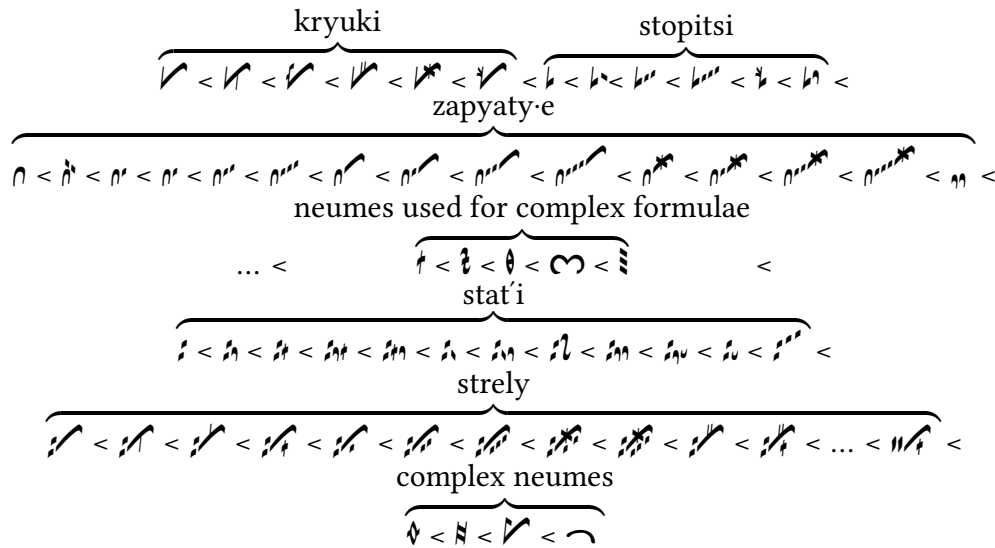
Next, we order the red modifying marks. We first classify these marks by function: marks indicating duration and marks indicating movement. We order the duration marks from long to short (Tikhaya, Borzaya, and Udarka); then we order the movement marks in the way that they are typically presented in traditional catalogs – by frequency of usage (Podvertka, Lomka, etc.). We encode the black modifying marks following the red modifying marks. Here we order first the Tonal Range Markers (in order of ascending pitch). Then, we again classify the marks by function, and order the marks indicating duration from long to short (Zaderzhka, Otsechka) and the marks indicating movement in the order typically presented in traditional catalogs (Podchashie, Oblachko, etc). The result is an ordering that is useful for collation because it captures the common features of the manuscript tradition, but is also intuitive for lookup since it places next to each other characters that are similar in function or appearance.

2.3 Order of Encoding

In the Unicode Standard (see Section 2.11) all combining characters are to be used in sequence following the character to which they apply, regardless of how the positioning of the combining mark ultimately takes place. Combining characters that position on the left of a base neume are generally presented to the left of the dotted circle in Unicode codecharts. In Znamenny Notation, combining Cinnabar Marks will usually position to the left of the base character, while other combining marks may position above, below, to the right of, or overlaying the base character. In addition to the technical aspect, we also consider how Znamenny neumes are typically drawn by hand in manuscripts. Commonly, one first draws the base neume (in black ink), then the tonal range markers (if present), then the remaining black modification marks, from left to right. Then, one picks up a red pen, and draws first the cinnabar pitch marks and then the remaining red modification marks, from left to right.

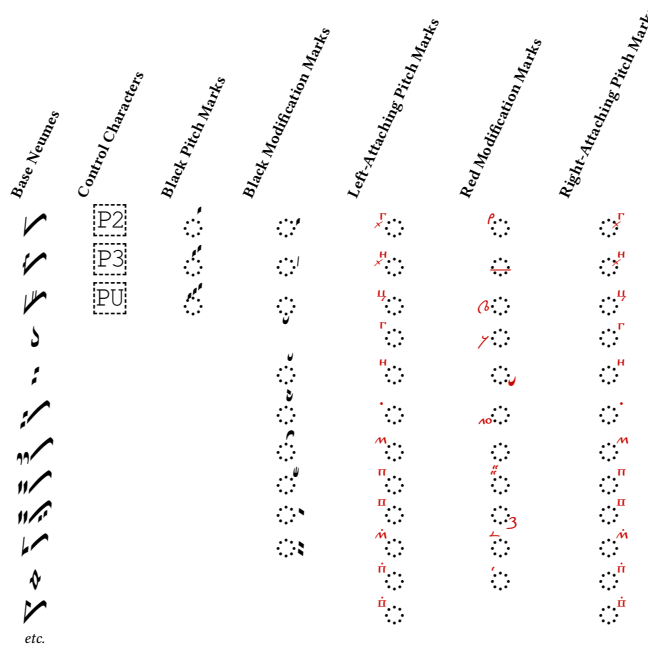
Therefore we propose the order of encoding, from left to right, given in Table 2. Note that the

Figure 22: Codepoint (and collation) order for Znamenny Notation



Priznak Modifier control characters, if present, must be encoded immediately after the base neume (even if they modify the tonal range markers in actual graphical appearance). Multiple left-attaching red pitch marks are encoded in sequence and by default stack diagonally along the base neume from left to right. Right-attaching red pitch marks are encoded following all other combining red marks.

Table 2: Order of encoding (from left to right)



3 Unicode Character Properties

1CF00;ZNAMENNY COMBINING MARK GORAZDO NIZKO S KRYZHEM ON LEFT;Mn;0;NSM;;;N;;;;;
1CF01;ZNAMENNY COMBINING MARK NIZKO S KRYZHEM ON LEFT;Mn;0;NSM;;;N;;;;;
1CF02;ZNAMENNY COMBINING MARK TSATA ON LEFT;Mn;0;NSM;;;N;;;;;
1CF03;ZNAMENNY COMBINING MARK GORAZDO NIZKO ON LEFT;Mn;0;NSM;;;N;;;;;
1CF04;ZNAMENNY COMBINING MARK NIZKO ON LEFT;Mn;0;NSM;;;N;;;;;
1CF05;ZNAMENNY COMBINING MARK SREDNE ON LEFT;Mn;0;NSM;;;N;;;;;
1CF06;ZNAMENNY COMBINING MARK MALO POVYSHE ON LEFT;Mn;0;NSM;;;N;;;;;
1CF07;ZNAMENNY COMBINING MARK POVYSHE ON LEFT;Mn;0;NSM;;;N;;;;;
1CF08;ZNAMENNY COMBINING MARK VYSOKO ON LEFT;Mn;0;NSM;;;N;;;;;
1CF09;ZNAMENNY COMBINING MARK MALO POVYSHE S KHOKHLOM ON LEFT;Mn;0;NSM;;;N;;;;;
1CF0A;ZNAMENNY COMBINING MARK POVYSHE S KHOKHLOM ON LEFT;Mn;0;NSM;;;N;;;;;
1CF0B;ZNAMENNY COMBINING MARK VYSOKO S KHOKHLOM ON LEFT;Mn;0;NSM;;;N;;;;;
1CF0C;ZNAMENNY COMBINING MARK GORAZDO NIZKO S KRYZHEM ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF0D;ZNAMENNY COMBINING MARK NIZKO S KRYZHEM ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF0E;ZNAMENNY COMBINING MARK TSATA ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF0F;ZNAMENNY COMBINING MARK GORAZDO NIZKO ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF10;ZNAMENNY COMBINING MARK NIZKO ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF11;ZNAMENNY COMBINING MARK SREDNE ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF12;ZNAMENNY COMBINING MARK MALO POVYSHE ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF13;ZNAMENNY COMBINING MARK POVYSHE ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF14;ZNAMENNY COMBINING MARK VYSOKO ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF15;ZNAMENNY COMBINING MARK MALO POVYSHE S KHOKHLOM ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF16;ZNAMENNY COMBINING MARK POVYSHE S KHOKHLOM ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF17;ZNAMENNY COMBINING MARK VYSOKO S KHOKHLOM ON RIGHT;Mn;0;NSM;;;N;;;;;
1CF18;ZNAMENNY COMBINING MARK TSATA S KRYZHEM;Mn;0;NSM;;;N;;;;;
1CF19;ZNAMENNY COMBINING MARK MALO POVYSHE S KRYZHEM;Mn;0;NSM;;;N;;;;;
1CF1A;ZNAMENNY COMBINING MARK STRANNO MALO POVYSHE;Mn;0;NSM;;;N;;;;;
1CF1B;ZNAMENNY COMBINING MARK POVYSHE S KRYZHEM;Mn;0;NSM;;;N;;;;;
1CF1C;ZNAMENNY COMBINING MARK POVYSHE STRANNO;Mn;0;NSM;;;N;;;;;
1CF1D;ZNAMENNY COMBINING MARK VYSOKO S KRYZHEM;Mn;0;NSM;;;N;;;;;
1CF1E;ZNAMENNY COMBINING MARK MALO POVYSHE STRANNO;Mn;0;NSM;;;N;;;;;
1CF1F;ZNAMENNY COMBINING MARK GORAZDO VYSOKO;Mn;0;NSM;;;N;;;;;
1CF20;ZNAMENNY COMBINING MARK ZELO;Mn;0;NSM;;;N;;;;;
1CF21;ZNAMENNY COMBINING MARK ON;Mn;0;NSM;;;N;;;;;
1CF22;ZNAMENNY COMBINING MARK RAVNO;Mn;0;NSM;;;N;;;;;
1CF23;ZNAMENNY COMBINING MARK TIKHAYA;Mn;0;NSM;;;N;;;;;
1CF24;ZNAMENNY COMBINING MARK BORZAYA;Mn;0;NSM;;;N;;;;;
1CF25;ZNAMENNY COMBINING MARK UDARKA;Mn;0;NSM;;;N;;;;;
1CF26;ZNAMENNY COMBINING MARK PODVERTKA;Mn;0;NSM;;;N;;;;;
1CF27;ZNAMENNY COMBINING MARK LOMKA;Mn;0;NSM;;;N;;;;;
1CF28;ZNAMENNY COMBINING MARK KUPNAYA;Mn;0;NSM;;;N;;;;;
1CF29;ZNAMENNY COMBINING MARK KACHKA;Mn;0;NSM;;;N;;;;;
1CF2A;ZNAMENNY COMBINING MARK ZEVOK;Mn;0;NSM;;;N;;;;;
1CF2B;ZNAMENNY COMBINING MARK SKOBA;Mn;0;NSM;;;N;;;;;
1CF2C;ZNAMENNY COMBINING MARK RAZSEKA;Mn;0;NSM;;;N;;;;;
1CF2D;ZNAMENNY COMBINING MARK KRYZH;Mn;0;NSM;;;N;;;;;
1CF30;ZNAMENNY COMBINING TONAL RANGE MARK MRACHNO;Mn;0;NSM;;;N;;;;;
1CF31;ZNAMENNY COMBINING TONAL RANGE MARK SVETLO;Mn;0;NSM;;;N;;;;;

1CF32;ZNAMENNY COMBINING TONAL RANGE MARK TRESVETLO;Mn;0;NSM;;;N;;;;
1CF33;ZNAMENNY COMBINING MARK ZADERZHKA;Mn;0;NSM;;;N;;;;
1CF34;ZNAMENNY COMBINING MARK DEMESTVENNY ZADERZHKA;Mn;0;NSM;;;N;;;;
1CF35;ZNAMENNY COMBINING MARK OTSECHKA;Mn;0;NSM;;;N;;;;
1CF36;ZNAMENNY COMBINING MARK PODCHASHIE;Mn;0;NSM;;;N;;;;
1CF37;ZNAMENNY COMBINING MARK PODCHASHIE WITH VERTICAL STROKE;Mn;0;NSM;;;N;;;;
1CF38;ZNAMENNY COMBINING MARK CHASHKA;Mn;0;NSM;;;N;;;;
1CF39;ZNAMENNY COMBINING MARK CHASHKA POLNAYA;Mn;0;NSM;;;N;;;;
1CF3A;ZNAMENNY COMBINING MARK OBLACHKO;Mn;0;NSM;;;N;;;;
1CF3B;ZNAMENNY COMBINING MARK SOROCHYA NOZHKA;Mn;0;NSM;;;N;;;;
1CF3C;ZNAMENNY COMBINING MARK TOCHKA;Mn;0;NSM;;;N;;;;
1CF3D;ZNAMENNY COMBINING MARK DVOETOCHIE;Mn;0;NSM;;;N;;;;
1CF3E;ZNAMENNY COMBINING ATTACHING VERTICAL OMET;Mn;0;NSM;;;N;;;;
1CF3F;ZNAMENNY COMBINING MARK CURVED OMET;Mn;0;NSM;;;N;;;;
1CF40;ZNAMENNY COMBINING MARK KRYZH;Mn;0;NSM;;;N;;;;
1CF41;ZNAMENNY COMBINING LOWER TONAL RANGE INDICATOR;Mn;0;NSM;;;N;;;;
1CF42;ZNAMENNY PRIZNAK MODIFIER LEVEL 2;Cf;0;BN;;;N;;;;
1CF43;ZNAMENNY PRIZNAK MODIFIER LEVEL 3;Cf;0;BN;;;N;;;;
1CF44;ZNAMENNY PRIZNAK MODIFIER DIRECTION FLIP;Cf;0;BN;;;N;;;;
1CF45;ZNAMENNY PRIZNAK MODIFIER KRYZH;Cf;0;BN;;;N;;;;
1CF46;ZNAMENNY PRIZNAK MODIFIER ROG;Cf;0;BN;;;N;;;;
1CF50;ZNAMENNY NEUME KRYUK;So;0;L;;;N;;;;
1CF51;ZNAMENNY NEUME KRYUK TIKHY;So;0;L;;;N;;;;
1CF52;ZNAMENNY NEUME PARAKLIT;So;0;L;;;N;;;;
1CF53;ZNAMENNY NEUME DVA V CHELNU;So;0;L;;;N;;;;
1CF54;ZNAMENNY NEUME KLYUCH;So;0;L;;;N;;;;
1CF55;ZNAMENNY NEUME ZANOEHEK;So;0;L;;;N;;;;
1CF56;ZNAMENNY NEUME STOPITSA;So;0;L;;;N;;;;
1CF57;ZNAMENNY NEUME STOPITSA S OCHKOM;So;0;L;;;N;;;;
1CF58;ZNAMENNY NEUME PEREVODKA;So;0;L;;;N;;;;
1CF59;ZNAMENNY NEUME PEREVODKA NEPOSTOYANNAYA;So;0;L;;;N;;;;
1CF5A;ZNAMENNY NEUME STOPITSA WITH SOROCHYA NOZHKA;So;0;L;;;N;;;;
1CF5B;ZNAMENNY NEUME CHELYUSTKA;So;0;L;;;N;;;;
1CF5C;ZNAMENNY NEUME PALKA;So;0;L;;;N;;;;
1CF5D;ZNAMENNY NEUME ZAPYATAYA;So;0;L;;;N;;;;
1CF5E;ZNAMENNY NEUME GOLUBCHIK BORZY;So;0;L;;;N;;;;
1CF5F;ZNAMENNY NEUME GOLUBCHIK TIKHY;So;0;L;;;N;;;;
1CF60;ZNAMENNY NEUME GOLUBCHIK MRACHNY;So;0;L;;;N;;;;
1CF61;ZNAMENNY NEUME GOLUBCHIK SVETLY;So;0;L;;;N;;;;
1CF62;ZNAMENNY NEUME GOLUBCHIK TRESVETLY;So;0;L;;;N;;;;
1CF63;ZNAMENNY NEUME VRAKHIYA PROSTAYA;So;0;L;;;N;;;;
1CF64;ZNAMENNY NEUME VRAKHIYA MRACHNAYA;So;0;L;;;N;;;;
1CF65;ZNAMENNY NEUME VRAKHIYA SVETLAYA;So;0;L;;;N;;;;
1CF66;ZNAMENNY NEUME VRAKHIYA TRESVETLAYA;So;0;L;;;N;;;;
1CF67;ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA PROSTAYA;So;0;L;;;N;;;;
1CF68;ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA MRACHNAYA;So;0;L;;;N;;;;
1CF69;ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA SVETLAYA;So;0;L;;;N;;;;
1CF6A;ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA TRESVETLAYA;So;0;L;;;N;;;;
1CF6B;ZNAMENNY NEUME DOUBLE ZAPYATAYA;So;0;L;;;N;;;;
1CF6C;ZNAMENNY NEUME REVERSED CHELYUSTKA;So;0;L;;;N;;;

1CF6D;ZNAMENNY NEUME DERBITSA;So;0;L;;;N;;;;;
1CF6E;ZNAMENNY NEUME KHAMILO;So;0;L;;;N;;;;;
1CF6F;ZNAMENNY NEUME CHASHKA;So;0;L;;;N;;;;;
1CF70;ZNAMENNY NEUME PODCHASHIE;So;0;L;;;N;;;;;
1CF71;ZNAMENNY NEUME SKAMEY TSA MRACHNAYA;So;0;L;;;N;;;;;
1CF72;ZNAMENNY NEUME SKAMEY TSA SVETLAYA;So;0;L;;;N;;;;;
1CF73;ZNAMENNY NEUME SKAMEY TSA TRESVETLAYA;So;0;L;;;N;;;;;
1CF74;ZNAMENNY NEUME SKAMEY TSA TIKHAYA;So;0;L;;;N;;;;;
1CF75;ZNAMENNY NEUME DEMESTVENNY KLYUCH;So;0;L;;;N;;;;;
1CF76;ZNAMENNY NEUME SKAMEY TSA KLYUCHEVAYA SVETLAYA;So;0;L;;;N;;;;;
1CF77;ZNAMENNY NEUME SKAMEY TSA KLYUCHENEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CF78;ZNAMENNY NEUME SKAMEY TSA KLYUCHEVAYA TIKHAYA;So;0;L;;;N;;;;;
1CF79;ZNAMENNY NEUME SKAMEY TSA DVOECHELNAYA PROSTAYA;So;0;L;;;N;;;;;
1CF7A;ZNAMENNY NEUME SKAMEY TSA DVOECHELNAYA SVETLAYA;So;0;L;;;N;;;;;
1CF7B;ZNAMENNY NEUME SKAMEY TSA DVOECHELNAYA NEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CF7C;ZNAMENNY NEUME SKAMEY TSA DVOECHELNAYA KLYUCHEVAYA;So;0;L;;;N;;;;;
1CF7D;ZNAMENNY NEUME SLOZHITIE;So;0;L;;;N;;;;;
1CF7E;ZNAMENNY NEUME SLOZHITIE S ZAPYATOY;So;0;L;;;N;;;;;
1CF7F;ZNAMENNY NEUME SLOZHITIE ZAKRYTOE;So;0;L;;;N;;;;;
1CF80;ZNAMENNY NEUME SLOZHITIE S KRYZHEM;So;0;L;;;N;;;;;
1CF81;ZNAMENNY NEUME KRYZH;So;0;L;;;N;;;;;
1CF82;ZNAMENNY NEUME ROG;So;0;L;;;N;;;;;
1CF83;ZNAMENNY NEUME FITA;So;0;L;;;N;;;;;
1CF84;ZNAMENNY NEUME KOBYLA;So;0;L;;;N;;;;;
1CF85;ZNAMENNY NEUME ZMEY TSA;So;0;L;;;N;;;;;
1CF86;ZNAMENNY NEUME STATYA;So;0;L;;;N;;;;;
1CF87;ZNAMENNY NEUME STATYA S ZAPYATOY;So;0;L;;;N;;;;;
1CF88;ZNAMENNY NEUME STATYA S KRYZHEM;So;0;L;;;N;;;;;
1CF89;ZNAMENNY NEUME STATYA S ZAPYATOY I KRYZHEM;So;0;L;;;N;;;;;
1CF8A;ZNAMENNY NEUME STATYA S KRYZHEM I ZAPYATOY;So;0;L;;;N;;;;;
1CF8B;ZNAMENNY NEUME STATYA ZAKRYTAYA;So;0;L;;;N;;;;;
1CF8C;ZNAMENNY NEUME STATYA ZAKRYTAYA S ZAPYATOY;So;0;L;;;N;;;;;
1CF8D;ZNAMENNY NEUME STATYA S ROGOM;So;0;L;;;N;;;;;
1CF8E;ZNAMENNY NEUME STATYA S DVUMYA ZAPYATYMI;So;0;L;;;N;;;;;
1CF8F;ZNAMENNY NEUME STATYA S ZAPYATOY I PODCHASHIEM;So;0;L;;;N;;;;;
1CF90;ZNAMENNY NEUME POLKULIZMY;So;0;L;;;N;;;;;
1CF91;ZNAMENNY NEUME STATYA NEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CF92;ZNAMENNY NEUME STRELA PROSTAYA;So;0;L;;;N;;;;;
1CF93;ZNAMENNY NEUME STRELA MRACHNOTIKHAYA;So;0;L;;;N;;;;;
1CF94;ZNAMENNY NEUME STRELA KRYZHEVAYA;So;0;L;;;N;;;;;
1CF95;ZNAMENNY NEUME STRELA POLUPOVODNAYA;So;0;L;;;N;;;;;
1CF96;ZNAMENNY NEUME STRELA POVODNAYA;So;0;L;;;N;;;;;
1CF97;ZNAMENNY NEUME STRELA NEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CF98;ZNAMENNY NEUME STRELA KLYUCHEPOVODNAYA;So;0;L;;;N;;;;;
1CF99;ZNAMENNY NEUME STRELA KLYUCHENEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CF9A;ZNAMENNY NEUME STRELA TIKHAYA PUTNAYA;So;0;L;;;N;;;;;
1CF9B;ZNAMENNY NEUME STRELA DVOECHELNAYA;So;0;L;;;N;;;;;
1CF9C;ZNAMENNY NEUME STRELA DVOECHELNOKRYZHEVAYA;So;0;L;;;N;;;;;
1CF9D;ZNAMENNY NEUME STRELA DVOECHELNOPOVODNAYA;So;0;L;;;N;;;;;
1CF9E;ZNAMENNY NEUME STRELA DVOECHELNAYA KLYUCHEVAYA;So;0;L;;;N;;;;;

1CF9F;ZNAMENNY NEUME STRELA DVOECHELNOPOVODNAYA KLYUCHEVAYA;So;0;L;;;N;;;;;
1CFA0;ZNAMENNY NEUME STRELA GROMNAYA WITH SINGLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFA1;ZNAMENNY NEUME STRELA GROMOPOVODNAYA WITH SINGLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFA2;ZNAMENNY NEUME STRELA GROMNAYA;So;0;L;;;N;;;;;
1CFA3;ZNAMENNY NEUME STRELA GROMOPOVODNAYA;So;0;L;;;N;;;;;
1CFA4;ZNAMENNY NEUME STRELA GROMOPOVODNAYA WITH DOUBLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFA5;ZNAMENNY NEUME STRELA GROMOKRYZHEVAYA;So;0;L;;;N;;;;;
1CFA6;ZNAMENNY NEUME STRELA GROMOKRYZHEVAYA POVODNAYA;So;0;L;;;N;;;;;
1CFA7;ZNAMENNY NEUME MECHIK;So;0;L;;;N;;;;;
1CFA8;ZNAMENNY NEUME MECHIK POVODNY;So;0;L;;;N;;;;;
1CFA9;ZNAMENNY NEUME MECHIK KLYUCHEVOY;So;0;L;;;N;;;;;
1CFAA;ZNAMENNY NEUME MECHIK KLYUCHEPOVODNY;So;0;L;;;N;;;;;
1CFAB;ZNAMENNY NEUME MECHIK KLYUCHENEPOSTOYANNY;So;0;L;;;N;;;;;
1CFAC;ZNAMENNY NEUME STRELA TRYASOGLASNAYA;So;0;L;;;N;;;;;
1CFAD;ZNAMENNY NEUME STRELA TRYASOPOVODNAYA;So;0;L;;;N;;;;;
1CFAE;ZNAMENNY NEUME STRELA TRYASOSTRELNAYA;So;0;L;;;N;;;;;
1CFAF;ZNAMENNY NEUME OSOKA;So;0;L;;;N;;;;;
1CFB0;ZNAMENNY NEUME OSOKA SVETLAYA;So;0;L;;;N;;;;;
1CFB1;ZNAMENNY NEUME OSOKA TRESVETLAYA;So;0;L;;;N;;;;;
1CFB2;ZNAMENNY NEUME OSOKA KRYUKOVAYA SVETLAYA;So;0;L;;;N;;;;;
1CFB3;ZNAMENNY NEUME OSOKA KLYUCHEVAYA SVETLAYA;So;0;L;;;N;;;;;
1CFB4;ZNAMENNY NEUME OSOKA KLYUCHEVAYA NEPOSTOYANNAYA;So;0;L;;;N;;;;;
1CFB5;ZNAMENNY NEUME STRELA KRYUKOVAYA;So;0;L;;;N;;;;;
1CFB6;ZNAMENNY NEUME STRELA KRYUKOVAYA POVODNAYA;So;0;L;;;N;;;;;
1CFB7;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMNAYA WITH SINGLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFB8;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA WITH SINGLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFB9;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMNAYA;So;0;L;;;N;;;;;
1CFBA;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA;So;0;L;;;N;;;;;
1CFBB;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA WITH DOUBLE ZAPYATAYA;So;0;L;;;N;;;;;
1CFBC;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOKRYZHEVAYA;So;0;L;;;N;;;;;
1CFBD;ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOKRYZHEVAYA POVODNAYA;So;0;L;;;N;;;;;
1CFBE;ZNAMENNY NEUME STRELA KRYUKOVAYA TRYASKA;So;0;L;;;N;;;;;
1CFBF;ZNAMENNY NEUME ROZHEK;So;0;L;;;N;;;;;
1CFC0;ZNAMENNY NEUME STRELA ROZHNAYA;So;0;L;;;N;;;;;
1CFC1;ZNAMENNY NEUME DUDA;So;0;L;;;N;;;;;
1CFC2;ZNAMENNY NEUME NEMKA;So;0;L;;;N;;;;;
1CFC3;ZNAMENNY NEUME PAUK;So;0;L;;;N;;;;;
1CFC4;ZNAMENNY NEUME OBLAKO;So;0;L;;;N;;;;;

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| | 1CF0 | 1CF1 | 1CF2 | 1CF3 | 1CF4 | 1CF5 | 1CF6 | 1CF7 | 1CF8 | 1CF9 | 1CFA | 1CFB | 1CFC |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0 | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
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| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| A | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | |

Combining Red Marks

| | | |
|-------|----------------|--|
| 1CF00 | ◌ ^o | ZNAMENNY COMBINING MARK GORAZDO NIZKO S KRYZHEM ON LEFT |
| 1CF01 | ◌ ^o | ZNAMENNY COMBINING MARK NIZKO S KRYZHEM ON LEFT |
| 1CF02 | ◌ ^o | ZNAMENNY COMBINING MARK TSATA ON LEFT |
| 1CF03 | ◌ ^o | ZNAMENNY COMBINING MARK GORAZDO NIZKO ON LEFT |
| 1CF04 | ◌ ^o | ZNAMENNY COMBINING MARK NIZKO ON LEFT |
| 1CF05 | ◌ ^o | ZNAMENNY COMBINING MARK SREDNE ON LEFT |
| 1CF06 | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE ON LEFT |
| 1CF07 | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE ON LEFT |
| 1CF08 | ◌ ^o | ZNAMENNY COMBINING MARK VYSOKO ON LEFT |
| 1CF09 | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE S KHOKHLOM ON LEFT |
| 1CF0A | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE S KHOKHLOM ON LEFT |
| 1CF0B | ◌ ^o | ZNAMENNY COMBINING MARK VYSOKO S KHOKHLOM ON LEFT |
| 1CF0C | ◌ ^o | ZNAMENNY COMBINING MARK GORAZDO NIZKO S KRYZHEM ON RIGHT |
| 1CF0D | ◌ ^o | ZNAMENNY COMBINING MARK NIZKO S KRYZHEM ON RIGHT |
| 1CF0E | ◌ ^o | ZNAMENNY COMBINING MARK TSATA ON RIGHT |
| 1CF0F | ◌ ^o | ZNAMENNY COMBINING MARK GORAZDO NIZKO ON RIGHT |
| 1CF10 | ◌ ^o | ZNAMENNY COMBINING MARK NIZKO ON RIGHT |
| 1CF11 | ◌ ^o | ZNAMENNY COMBINING MARK SREDNE ON RIGHT |
| 1CF12 | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE ON RIGHT |
| 1CF13 | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE ON RIGHT |
| 1CF14 | ◌ ^o | ZNAMENNY COMBINING MARK VYSOKO ON RIGHT |
| 1CF15 | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE S KHOKHLOM ON RIGHT |
| 1CF16 | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE S KHOKHLOM ON RIGHT |
| 1CF17 | ◌ ^o | ZNAMENNY COMBINING MARK VYSOKO S KHOKHLOM ON RIGHT |
| 1CF18 | ◌ ^o | ZNAMENNY COMBINING MARK TSATA S KRYZHEM |
| 1CF19 | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE S KRYZHEM |
| 1CF1A | ◌ ^o | ZNAMENNY COMBINING MARK STRANNO MALO POVYSHE |
| 1CF1B | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE S KRYZHEM |
| 1CF1C | ◌ ^o | ZNAMENNY COMBINING MARK POVYSHE STRANNO |
| 1CF1D | ◌ ^o | ZNAMENNY COMBINING MARK VYSOKO S KRYZHEM |
| 1CF1E | ◌ ^o | ZNAMENNY COMBINING MARK MALO POVYSHE STRANNO |
| 1CF1F | ◌ ^o | ZNAMENNY COMBINING MARK GORAZDO VYSOKO |
| 1CF20 | ◌ ^o | ZNAMENNY COMBINING MARK ZELO |
| 1CF21 | ◌ ^o | ZNAMENNY COMBINING MARK ON |
| 1CF22 | ◌ ^o | ZNAMENNY COMBINING MARK RAVNO |
| 1CF23 | ◌ ^o | ZNAMENNY COMBINING MARK TIKHAYA |
| 1CF24 | ◌ ^o | ZNAMENNY COMBINING MARK BORZAYA |
| 1CF25 | ◌ ^o | ZNAMENNY COMBINING MARK UDARKA |
| 1CF26 | ◌ ^o | ZNAMENNY COMBINING MARK PODVERTKA |

| | | |
|-------|----------------|---------------------------------|
| 1CF27 | ◌ ^o | ZNAMENNY COMBINING MARK LOMKA |
| 1CF28 | ◌ ^o | ZNAMENNY COMBINING MARK KUPNAYA |
| 1CF29 | ◌ ^o | ZNAMENNY COMBINING MARK KACHKA |
| 1CF2A | ◌ ^o | ZNAMENNY COMBINING MARK ZEVOK |
| 1CF2B | ◌ ^o | ZNAMENNY COMBINING MARK SKOBA |
| 1CF2C | ◌ ^o | ZNAMENNY COMBINING MARK RAZSEKA |
| 1CF2D | ◌ ^o | ZNAMENNY COMBINING MARK KRYZH |

Combining Black Marks

| | | |
|-------|----------------|---|
| 1CF30 | ◌ ^b | ZNAMENNY COMBINING TONAL RANGE MARK MRACHNO |
| 1CF31 | ◌ ^b | ZNAMENNY COMBINING TONAL RANGE MARK SVETLO |
| 1CF32 | ◌ ^b | ZNAMENNY COMBINING TONAL RANGE MARK TRESVETLO |
| 1CF33 | ◌ ^b | ZNAMENNY COMBINING MARK ZADERZHKA • Ottyazhka |
| 1CF34 | ◌ ^b | ZNAMENNY COMBINING MARK DEMESTVENNY ZADERZHKA |
| 1CF35 | ◌ ^b | ZNAMENNY COMBINING MARK OTSECHKA |
| 1CF36 | ◌ ^b | ZNAMENNY COMBINING MARK PODCHASHIE |
| 1CF37 | ◌ ^b | ZNAMENNY COMBINING MARK PODCHASHIE WITH VERTICAL STROKE |
| 1CF38 | ◌ ^b | ZNAMENNY COMBINING MARK CHASHKA |
| 1CF39 | ◌ ^b | ZNAMENNY COMBINING MARK CHASHKA POLNAYA |
| 1CF3A | ◌ ^b | ZNAMENNY COMBINING MARK OBLACHKO |
| 1CF3B | ◌ ^b | ZNAMENNY COMBINING MARK SOROCHYA NOZHKA • Sokolik |
| 1CF3C | ◌ ^b | ZNAMENNY COMBINING MARK TOCHKA |
| 1CF3D | ◌ ^b | ZNAMENNY COMBINING MARK DVOETOCHIE |
| 1CF3E | ◌ ^b | ZNAMENNY COMBINING ATTACHING VERTICAL OMET |
| 1CF3F | ◌ ^b | ZNAMENNY COMBINING MARK CURVED OMET |
| 1CF40 | ◌ ^b | ZNAMENNY COMBINING MARK KRYZH |
| 1CF41 | ◌ ^b | ZNAMENNY COMBINING LOWER TONAL RANGE INDICATOR |

Control Characters for Priznaki

| | | |
|-------|-----------------|--|
| 1CF42 | ◌ ^{P2} | ZNAMENNY PRIZNAK MODIFIER LEVEL 2 |
| 1CF43 | ◌ ^{P3} | ZNAMENNY PRIZNAK MODIFIER LEVEL 3 |
| 1CF44 | ◌ ^{PU} | ZNAMENNY PRIZNAK MODIFIER DIRECTION FLIP |
| 1CF45 | ◌ ^{PK} | ZNAMENNY PRIZNAK MODIFIER KRYZH |
| 1CF46 | ◌ ^{PR} | ZNAMENNY PRIZNAK MODIFIER ROG |

Znamenny Neumes

| | | |
|-------|----------------|--|
| 1CF50 | ◌ [✓] | ZNAMENNY NEUME KRYUK |
| 1CF51 | ◌ [✓] | ZNAMENNY NEUME KRYUK TIKHY |
| 1CF52 | ◌ [✓] | ZNAMENNY NEUME PARAKLIT |
| 1CF53 | ◌ [✓] | ZNAMENNY NEUME DVA V CHELNU |
| 1CF54 | ◌ [✓] | ZNAMENNY NEUME KLYUCH • Kryuk Klyuchevoy |
| 1CF55 | ◌ [✓] | ZNAMENNY NEUME ZANOZHEK |
| 1CF56 | ◌ [✓] | ZNAMENNY NEUME STOPITSA |
| 1CF57 | ◌ [✓] | ZNAMENNY NEUME STOPITSA S OCHKOM |
| 1CF58 | ◌ [✓] | ZNAMENNY NEUME PEREVODKA |
| 1CF59 | ◌ [✓] | ZNAMENNY NEUME PEREVODKA NEPOSTOYANNAYA |
| 1CF5A | ◌ [✓] | ZNAMENNY NEUME STOPITSA WITH SOROCHYA NOZHKA • This is not a decomposable character |
| 1CF5B | ◌ [✓] | ZNAMENNY NEUME CHELYUSTKA |

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|-------|---|--|-------|---|--|
| 1CF5C | γ | ZNAMENNY NEUME PALKA | 1CF85 | ≡ | ZNAMENNY NEUME ZMEY TSA |
| 1CF5D | η | ZNAMENNY NEUME ZAPYATAYA | | | • Litso |
| 1CF5E | θ | ZNAMENNY NEUME GOLUBCHIK BORZY | 1CF86 | ∴ | ZNAMENNY NEUME STATYA |
| 1CF5F | ι | ZNAMENNY NEUME GOLUBCHIK TIKHY | 1CF87 | ⋈ | ZNAMENNY NEUME STATYA S ZAPYATOY |
| 1CF60 | κ | ZNAMENNY NEUME GOLUBCHIK MRACHNY | 1CF88 | ⋈ | ZNAMENNY NEUME STATYA S KRYZHEM |
| 1CF61 | λ | ZNAMENNY NEUME GOLUBCHIK SVETLY | 1CF89 | ⋈ | ZNAMENNY NEUME STATYA S ZAPYATOY I KRYZHEM |
| 1CF62 | μ | ZNAMENNY NEUME GOLUBCHIK TRESVETLY | 1CF8A | ⋈ | ZNAMENNY NEUME STATYA S KRYZHEM I ZAPYATOY |
| | | • Golubchik Nepostoyanny | 1CF8B | ⋈ | ZNAMENNY NEUME STATYA ZAKRYTAYA |
| 1CF63 | ν | ZNAMENNY NEUME VRAKHIYA PROSTAYA | 1CF8C | ⋈ | ZNAMENNY NEUME STATYA ZAKRYTAYA S ZAPYATOY |
| 1CF64 | ξ | ZNAMENNY NEUME VRAKHIYA MRACHNAYA | 1CF8D | ⋈ | ZNAMENNY NEUME STATYA S ROGOM |
| 1CF65 | ο | ZNAMENNY NEUME VRAKHIYA SVETLAYA | 1CF8E | ⋈ | ZNAMENNY NEUME STATYA S DVUMYA ZAPYATYMI |
| 1CF66 | π | ZNAMENNY NEUME VRAKHIYA TRESVETLAYA | 1CF8F | ⋈ | ZNAMENNY NEUME STATYA S ZAPYATOY I PODCHASHIEM |
| | | • Vrakhia Nepostoyannaya | 1CF90 | ⋈ | ZNAMENNY NEUME POLKULIZMY |
| 1CF67 | ρ | ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA PROSTAYA | 1CF91 | ⋈ | • This is not a decomposable character |
| 1CF68 | σ | ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA MRACHNAYA | 1CF92 | ⋈ | ZNAMENNY NEUME STATYA NEPOSTOYANNAYA |
| 1CF69 | τ | ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA SVETLAYA | 1CF93 | ⋈ | ZNAMENNY NEUME STRELA PROSTAYA |
| 1CF6A | υ | ZNAMENNY NEUME VRAKHIYA KLYUCHEVAYA TRESVETLAYA | 1CF94 | ⋈ | ZNAMENNY NEUME STRELA MRACHNOTIKHAYA |
| | | • Vrakhia Klyuchevaya Nepostoyannaya | 1CF94 | ⋈ | ZNAMENNY NEUME STRELA KRYZHEVAYA |
| 1CF6B | φ | ZNAMENNY NEUME DOUBLE ZAPYATAYA | 1CF95 | ⋈ | • Strela Polukryzhevaya |
| 1CF6C | χ | ZNAMENNY NEUME REVERSED CHELYUSTKA | 1CF95 | ⋈ | ZNAMENNY NEUME STRELA POLUPOVODNAYA |
| 1CF6D | ψ | ZNAMENNY NEUME DERBITSA | 1CF96 | ⋈ | ZNAMENNY NEUME STRELA POVODNAYA |
| 1CF6E | ω | ZNAMENNY NEUME KHAMILO | 1CF97 | ⋈ | ZNAMENNY NEUME STRELA NEPOSTOYANNAYA |
| 1CF6F | δ | ZNAMENNY NEUME CHASHKA | 1CF98 | ⋈ | ZNAMENNY NEUME STRELA KLYUCHEPOVODNAYA |
| 1CF70 | ϵ | ZNAMENNY NEUME PODCHASHIE | 1CF99 | ⋈ | ZNAMENNY NEUME STRELA KLYUCHENEPOSTOYANNAYA |
| 1CF71 | ζ | ZNAMENNY NEUME SKAMEY TSA MRACHNAYA | 1CF9A | ⋈ | ZNAMENNY NEUME STRELA TIKHAYA PUTNAYA |
| 1CF72 | η | ZNAMENNY NEUME SKAMEY TSA SVETLAYA | 1CF9B | ⋈ | ZNAMENNY NEUME STRELA DVOEHELNAYA |
| 1CF73 | θ | ZNAMENNY NEUME SKAMEY TSA TRESVETLAYA | 1CF9C | ⋈ | ZNAMENNY NEUME STRELA DVOEHELNOKRYZHEVAYA |
| 1CF74 | ι | ZNAMENNY NEUME SKAMEY TSA TIKHAYA | 1CF9D | ⋈ | ZNAMENNY NEUME STRELA DVOEHELNOPOVODNAYA |
| 1CF75 | κ | ZNAMENNY NEUME DEMESTVENNY KLYUCH | 1CF9E | ⋈ | ZNAMENNY NEUME STRELA DVOEHELNAYA KLYUCHEVAYA |
| | | • Skameytsa Klyuchevaya | 1CF9F | ⋈ | ZNAMENNY NEUME STRELA DVOEHELNOPOVODNAYA KLYUCHEVAYA |
| 1CF76 | λ | ZNAMENNY NEUME SKAMEY TSA KLYUCHEVAYA SVETLAYA | 1CFA0 | ⋈ | ZNAMENNY NEUME STRELA GROMNAYA WITH SINGLE ZAPYATAYA |
| 1CF77 | μ | ZNAMENNY NEUME SKAMEY TSA KLYUCHENEPOSTOYANNAYA | 1CFA1 | ⋈ | ZNAMENNY NEUME STRELA GROMOPOVODNAYA WITH SINGLE ZAPYATAYA |
| 1CF78 | ν | ZNAMENNY NEUME SKAMEY TSA KLYUCHEVAYA TIKHAYA | 1CFA2 | ⋈ | ZNAMENNY NEUME STRELA GROMNAYA |
| 1CF79 | ξ | ZNAMENNY NEUME SKAMEY TSA DVOEHELNAYA PROSTAYA | 1CFA3 | ⋈ | ZNAMENNY NEUME STRELA GROMOPOVODNAYA |
| 1CF7A | ο | ZNAMENNY NEUME SKAMEY TSA DVOEHELNAYA SVETLAYA | 1CFA4 | ⋈ | ZNAMENNY NEUME STRELA GROMOPOVODNAYA WITH DOUBLE ZAPYATAYA |
| 1CF7B | π | ZNAMENNY NEUME SKAMEY TSA DVOEHELNAYA NEPOSTOYANNAYA | 1CFA5 | ⋈ | ZNAMENNY NEUME STRELA GROMOKRYZHEVAYA |
| 1CF7C | ρ | ZNAMENNY NEUME SKAMEY TSA DVOEHELNAYA KLYUCHEVAYA | 1CFA6 | ⋈ | ZNAMENNY NEUME STRELA GROMOKRYZHEVAYA POVODNAYA |
| 1CF7D | σ | ZNAMENNY NEUME SLOZHITIE | | | • Strela Gromomrchnaya s Kryzhem |
| 1CF7E | τ | ZNAMENNY NEUME SLOZHITIE S ZAPYATOY | 1CFA7 | ⋈ | ZNAMENNY NEUME MECHIK |
| 1CF7F | υ | ZNAMENNY NEUME SLOZHITIE ZAKRYTOE | 1CFA8 | ⋈ | ZNAMENNY NEUME MECHIK POVODNY |
| 1CF80 | φ | ZNAMENNY NEUME SLOZHITIE S KRYZHEM | 1CFA9 | ⋈ | ZNAMENNY NEUME MECHIK KLYUCHEVOY |
| 1CF81 | χ | ZNAMENNY NEUME KRYZH | 1CFAA | ⋈ | ZNAMENNY NEUME MECHIK KLYUCHEPOVODNY |
| 1CF82 | ψ | ZNAMENNY NEUME ROG | 1CFAB | ⋈ | ZNAMENNY NEUME MECHIK KLYUCHENEPOSTOYANNY |
| 1CF83 | ω | ZNAMENNY NEUME FITA | | | |
| 1CF84 | δ | ZNAMENNY NEUME KOBYLA | | | |

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| 1CFAC | | ZNAMENNY NEUME STRELA TRYASOGLASNAYA |
| 1CFAD | | ZNAMENNY NEUME STRELA TRYASOPOVODNAYA |
| 1CFAE | | ZNAMENNY NEUME STRELA TRYASOSTRELNAYA |
| 1CFAF | | ZNAMENNY NEUME OSOKA |
| 1CFB0 | | ZNAMENNY NEUME OSOKA SVETLAYA |
| 1CFB1 | | ZNAMENNY NEUME OSOKA TRESVETLAYA • Osoka Nepostoyannaya |
| 1CFB2 | | ZNAMENNY NEUME OSOKA KRYUKOVAYA SVETLAYA |
| 1CFB3 | | ZNAMENNY NEUME OSOKA KLYUCHEVAYA SVETLAYA |
| 1CFB4 | | ZNAMENNY NEUME OSOKA KLYUCHEVAYA NEPOSTOYANNAYA |
| 1CFB5 | | ZNAMENNY NEUME STRELA KRYUKOVAYA |
| 1CFB6 | | ZNAMENNY NEUME STRELA KRYUKOVAYA POVODNAYA |
| 1CFB7 | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMNAYA WITH SINGLE ZAPYATAYA |
| 1CFB8 | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA WITH SINGLE ZAPYATAYA |
| 1CFB9 | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMNAYA |
| 1CFBA | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA |
| 1CFBB | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOPOVODNAYA WITH DOUBLE ZAPYATAYA |
| 1CFBC | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOKRYZHEVAYA |
| 1CFBD | | ZNAMENNY NEUME STRELA KRYUKOVAYA GROMOKRYZHEVAYA POVODNAYA • Strela Kryukovaya Gromomrchnaya s Kryzhem |
| 1CFBE | | ZNAMENNY NEUME STRELA KRYUKOVAYA TRYASKA |
| 1CFBF | | ZNAMENNY NEUME ROZHEK |
| 1CFC0 | | ZNAMENNY NEUME STRELA ROZHNAYA |
| 1CFC1 | | ZNAMENNY NEUME DUDA |
| 1CFC2 | | ZNAMENNY NEUME NEMKA |
| 1CFC3 | | ZNAMENNY NEUME PAUK |
| 1CFC4 | | ZNAMENNY NEUME OBLAKO |

Appendix 1 Znamenny Notation Neumes and Combinations

Based on: L. F. Kalashnikov. *Azbuka Tserkovnago Znamennago Peniya*. 3rd rev. ed. Moscow, 1915.

| No. | Neume | Components |
|-----|-------|-------------------------------|
| 1 | | 1CF50 |
| 2 | | 1CF50 1CF35 |
| 3 | | 1CF50 1CF33 |
| 4 | | 1CF51 1CF31 1CF07 1CF27 |
| 5 | | 1CF50 1CF31 1CF36 1CF06 |
| 6 | | 1CF50 1CF31 1CF06 1CF26 |
| 7 | | 1CF52 1CF06 |
| 8 | | 1CF52 1CF35 1CF06 |
| 9 | | 1CF52 1CF33 1CF06 |
| 10 | | 1CF52 1CF36 1CF06 |
| 11 | | 1CF52 1CF26 1CF06 |
| 12 | | 1CF5D 1CF03 |
| 13 | | 1CF5D 1CF35 1CF03 |
| 14 | | 1CF5D 1CF03 1CF81 |
| 15 | | 1CF56 1CF06 |
| 16 | | 1CF56 1CF35 1CF06 |
| 17 | | 1CF57 1CF06 |
| 18 | | 1CF54 1CF06 |
| 19 | | 1CF5B 1CF06 |
| 20 | | 1CF70 1CF31 1CF06 |
| 21 | | 1CF5C 1CF06 |
| 22 | | 1CF5C 1CF35 1CF06 |
| 23 | | 1CF5C 1CF06 1CF26 |
| 24 | | 1CF5C 1CF3D |
| 25 | | 1CF5C 1CF3D 1CF26 1CF06 1CF29 |

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|-------|--|--|-------|--|-------|-------|-------|--|-------|--|--|-------|
| 26 | | | 1CF71 | | 1CF72 | | 1CF06 | | 1CF73 | | | |
| 27 | | | 1CF74 | | 1CF06 | | | | | | | |
| 28 | | | 1CF72 | | 1CF24 | | | | | | | |
| 29 | | | 1CF72 | | 1CF23 | | | | | | | |
| 30 | | | 1CF72 | | 1CF33 | | 1CF23 | | | | | |
| 31 | | | 1CF6D | | 1CF08 | | 1CF24 | | | | | |
| 32 | | | 1CF58 | | 1CF24 | | | | | | | |
| 33 | | | 1CF58 | | 1CF05 | | 1CF27 | | | | | |
| 34 | | | 1CF58 | | 1CF26 | | 1CF27 | | | | | |
| 35 | | | 1CF58 | | 1CF05 | | 1CF25 | | | | | |
| 36 | | | 1CF5E | | | | | | | | | |
| 37 | | | 1CF5F | | 1CF23 | | | | | | | |
| 38 | | | 1CF6F | | 1CF06 | | | | | | | |
| 39 | | | 1CF6F | | 1CF05 | | 1CF27 | | | | | |
| (39a) | | | 1CF6F | | 1CF2B | | | | | | | |
| 40 | | | 1CF6F | | 1CF3C | | 1CF05 | | | | | |
| 41 | | | 1CF86 | | 1CF03 | | | | | | | |
| 42 | | | 1CF87 | | 1CF03 | | | | | | | |
| 43 | | | 1CF87 | | 1CF05 | | 1CF23 | | | | | |
| 44 | | | 1CF88 | | 1CF04 | | | | | | | |
| 45 | | | 1CF90 | | 1CF23 | | 1CF05 | | | | | |
| 46 | | | 1CF86 | | 1CF30 | | 1CF05 | | | | | |
| 47 | | | 1CF92 | | 1CF06 | | | | | | | |
| 48 | | | 1CF92 | | 1CF30 | | 1CF06 | | 1CF22 | | | |
| 49 | | | 1CF92 | | 1CF30 | | 1CF3B | | 1CF05 | | | 1CF2A |
| 50 | | | 1CF92 | | 1CF36 | 1CF06 | | | | | | |
| 51 | | | 1CF92 | | 1CF07 | | 1CF26 | | 1CF24 | | | |
| 52 | | | 1CF86 | | 1CF31 | 1CF06 | | | | | | |

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|----|--|--|-------|--|-------|--|-------|--|-------|--|-------|--|-------|--|-------|--|-------|
| 53 | | | 1CF86 | | 1CF31 | | 1CF08 | | 1CF23 | | | | | | | | |
| 54 | | | 1CF86 | | 1CF31 | | 1CF3A | | 1CF0A | | 1CF22 | | | | | | |
| 55 | | | 1CF86 | | 1CF31 | | 1CF3B | | 1CF09 | | | | | | | | |
| 56 | | | 1CF8B | | 1CF06 | | 1CF22 | | | | | | | | | | |
| 57 | | | 1CF8B | | 1CF30 | | 1CF08 | | 1CF22 | | | | | | | | |
| 58 | | | 1CF8B | | 1CF30 | | 1CF04 | | 1CF23 | | 1CF22 | | | | | | |
| 59 | | | 1CF81 | | | | | | | | | | | | | | |
| 60 | | | 1CF82 | | | | | | | | | | | | | | |
| 61 | | | 1CF7D | | 1CF06 | | | | | | | | | | | | |
| 62 | | | 1CF7D | | 1CF06 | | 1CF28 | | | | | | | | | | |
| 63 | | | 1CF7D | | 1CF33 | | 1CF06 | | | | | | | | | | |
| 64 | | | 1CF7D | | 1CF06 | | 1CF26 | | | | | | | | | | |
| 65 | | | 1CF7D | | 1CF06 | | 1CF26 | | 1CF28 | | | | | | | | |
| 66 | | | 1CF7E | | 1CF06 | | | | | | | | | | | | |
| 67 | | | 1CF7E | | 1CF07 | | 1CF23 | | | | | | | | | | |
| 68 | | | 1CF7E | | 1CF07 | | 1CF26 | | | | | | | | | | |
| 69 | | | 1CF90 | | 1CF30 | | 1CF07 | | | | | | | | | | |
| 70 | | | 1CF53 | | 1CF06 | | 1CF29 | | | | | | | | | | |
| 71 | | | 1CF53 | | 1CF33 | | 1CF06 | | 1CF29 | | | | | | | | |
| 72 | | | 1CF53 | | 1CF35 | | 1CF06 | | 1CF29 | | | | | | | | |
| 73 | | | 1CF53 | | 1CF06 | | 1CF26 | | 1CF29 | | | | | | | | |
| 74 | | | 1CF53 | | 1CF36 | | 1CF06 | | 1CF29 | | | | | | | | |
| 75 | | | 1CFC1 | | 1CF92 | | 1CF07 | | 1CF23 | | 1CF24 | | | | | | |
| 76 | | | 1CFC1 | | 1CF92 | | 1CF30 | | 1CF3A | | 1CF07 | | 1CF23 | | 1CF24 | | 1CF22 |
| 77 | | | 1CFC1 | | 1CF87 | | 1CF06 | | | | | | | | | | |
| 78 | | | 1CFAF | | 1CF07 | | | | | | | | | | | | |
| 79 | | | 1CFC2 | | 1CF87 | | 1CF07 | | | | | | | | | | |

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|-----|--|-------|--|-------|--|--|--|
| 80 | | 1CFA7 | | 1CF06 | | | |
| 81 | | 1CF93 | | | | | |
| 82 | | 1CF93 | | | | | |
| 83 | | 1CF93 | | | | | |
| 84 | | 1CF94 | | | | | |
| 85 | | 1CF94 | | | | | |
| 86 | | 1CF94 | | | | | |
| 87 | | 1CF94 | | | | | |
| 88 | | 1CF94 | | | | | |
| 89 | | 1CF94 | | | | | |
| 90 | | 1CF94 | | | | | |
| 91 | | 1CF94 | | | | | |
| 92 | | 1CF94 | | | | | |
| 93 | | 1CF96 | | | | | |
| 93a | | 1CF96 | | | | | |
| 94 | | 1CF96 | | | | | |
| 95 | | 1CF96 | | | | | |
| 96 | | 1CF96 | | | | | |
| 97 | | 1CF92 | | | | | |
| 98 | | 1CF92 | | | | | |
| 99 | | 1CF92 | | | | | |
| 100 | | 1CF92 | | | | | |
| 101 | | 1CF92 | | | | | |
| 102 | | 1CF92 | | | | | |
| 103 | | 1CF92 | | | | | |

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|-----|--|-------|-------|-------|-------|-------|-------|
| 104 | | | | | | | |
| | | 1CF92 | 1CF31 | 1CF36 | 1CF07 | 1CF23 | |
| 105 | | | | | | | |
| | | 1CF93 | 1CF31 | 1CF07 | 1CF23 | | |
| 106 | | | | | | | |
| | | 1CF93 | 1CF31 | 1CF33 | 1CF07 | 1CF23 | |
| 107 | | | | | | | |
| | | 1CF96 | 1CF30 | 1CF07 | 1CF24 | | |
| 108 | | | | | | | |
| | | 1CFA2 | 1CF01 | | | | |
| 109 | | | | | | | |
| | | 1CFA2 | 1CF04 | 1CF24 | | | |
| 110 | | | | | | | |
| | | 1CFA2 | 1CF06 | 1CF29 | | | |
| 111 | | | | | | | |
| | | 1CFA2 | 1CF33 | 1CF06 | 1CF29 | | |
| 112 | | | | | | | |
| | | 1CFA2 | 1CF06 | 1CF26 | 1CF29 | | |
| 113 | | | | | | | |
| | | 1CFA2 | 1CF36 | 1CF06 | 1CF29 | | |
| 114 | | | | | | | |
| | | 1CFA2 | 1CF3B | 1CF06 | 1CF29 | 1CF2A | |
| 115 | | | | | | | |
| | | 1CFA2 | 1CF31 | 1CF08 | 1CF24 | | |
| 116 | | | | | | | |
| | | 1CFA3 | 1CF33 | 1CF06 | 1CF24 | | |
| 117 | | | | | | | |
| | | 1CFA2 | 1CF31 | 1CF08 | 1CF26 | 1CF24 | |
| 118 | | | | | | | |
| | | 1CFA2 | 1CF31 | 1CF36 | 1CF08 | 1CF24 | |
| 119 | | | | | | | |
| | | 1CFA2 | 1CF31 | 1CF3B | 1CF07 | 1CF24 | |
| 120 | | | | | | | |
| | | 1CFA3 | 1CF06 | 1CF23 | | | |
| 121 | | | | | | | |
| | | 1CFA2 | 1CF31 | 1CF33 | 1CF08 | | |
| 122 | | | | | | | |
| | | 1CFA5 | 1CF31 | 1CF08 | 1CF24 | | |
| 123 | | | | | | | |
| | | 1CFA5 | 1CF30 | 1CF33 | 1CF05 | 1CF24 | |
| 124 | | | | | | | |
| | | 1CFA5 | 1CF31 | 1CF06 | 1CF26 | 1CF24 | |
| 125 | | | | | | | |
| | | 1CFA5 | 1CF32 | 1CF36 | 1CF09 | 1CF24 | |
| 126 | | | | | | | |
| | | 1CFA5 | 1CF31 | 1CF3B | 1CF08 | 1CF24 | |
| 127 | | | | | | | |
| | | 1CFA5 | 1CF31 | 1CF3A | 1CF08 | 1CF24 | |
| 128 | | | | | | | |
| | | 1CFA5 | 1CF31 | 1CF3A | 1CF06 | 1CF24 | 1CF22 |
| 129 | | | | | | | |
| | | 1CFAC | 1CF08 | 1CF25 | | | |

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|-----|-------|-------|-------|-------|-------|-------|
| 130 | | | | | | |
| | 1CFAC | 1CF08 | 1CF26 | 1CF25 | | |
| 131 | | | | | | |
| | 1CFAC | 1CF36 | 1CF08 | 1CF25 | | |
| 132 | | | | | | |
| | 1CFAE | 1CF30 | 1CF33 | 1CF06 | 1CF25 | |
| 133 | | | | | | |
| | 1CFAD | 1CF30 | 1CF08 | 1CF25 | | |
| 134 | | | | | | |
| | 1CFC3 | | | | | |
| 135 | | | | | | |
| | 1CF86 | 1CF05 | 1CF24 | 1CFC3 | | |
| 136 | | | | | | |
| | 1CF8B | 1CF03 | 1CF22 | 1CF86 | 1CF05 | 1CF24 |
| 137 | | | | | | |
| | 1CF6E | | | | | |
| 138 | | | | | | |
| | 1CF7E | 1CF35 | 1CF07 | 1CF25 | | |
| 139 | | | | | | |
| | 1CF85 | | | | | |
| 140 | | | | | | |
| | 1CF90 | | | | | |
| 141 | | | | | | |
| | 1CF8B | 1CF30 | 1CF26 | 1CF22 | 1CF23 | |
| 142 | | | | | | |
| | 1CF86 | 1CF85 | | | | |








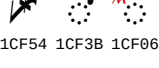

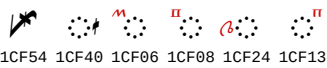

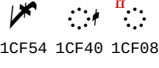

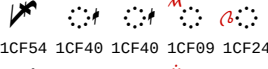



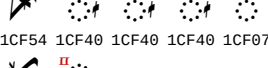



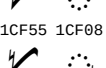

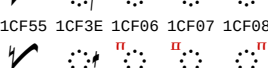

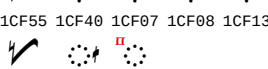

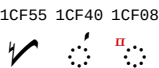

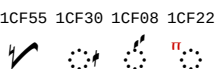

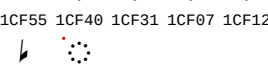

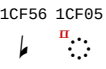

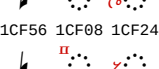

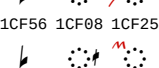



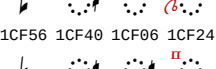

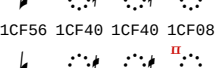

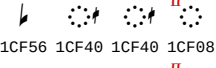

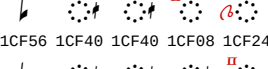



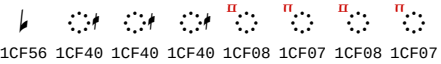
Appendix 2 Demestvenny Notation Neumes and Sequences

(1) = G. Pozhidayeva, *Leksikologiya Demestvennogo Peniya*. Moscow, 2010.

(2) = L. Kalashnikov, *Azbuka Demestvennogo Peniya*. Kiev, 1911.






























2.1 Base Neumes




| (1) | (2) | Name | Disp. | Encoding |
|------|-----|---|-------|-------------------------------------|
| 61 | 7 | Kryuk | | 1CF50 1CF04 |
| 62 | 16 | Kryuk with Sorochiya Nozhka | | 1CF50 1CF3B 1CF06 |
| 73 | 8,9 | Kryuk Ometny | | 1CF50 1CF3E 1CF08 |
| | 7 | Kryuk with Kryzh | | 1CF50 1CF40 1CF07 |
| 63 | | Kryuk with Kryzh | | 1CF50 1CF40 1CF07 1CF12 |
| 66 | 14 | Kryuk Mrachny | | 1CF50 1CF30 1CF08 |
| 67 | 16b | Kryuk Svetly | | 1CF50 1CF31 1CF08 |
| 74 | | Kryuk Svetloometny | | 1CF50 1CF3E 1CF31 1CF08 1CF22 1CF13 |
| 74a | 23 | Kryuk Svetloometny (non-attaching) | | 1CF50 1CF31 1CF3F 1CF08 |
| 68 | | Kryuk Svetly with Kryzh | | 1CF50 1CF40 1CF31 1CF06 1CF07 1CF12 |
| 71 | 17 | Kryuk Tresvetly | | 1CF50 1CF32 1CF09 |
| 132 | 13 | Kryuk with Podchashie | | 1CF50 1CF36 1CF08 |
| | 13b | Kryuk with Podchashie with Vertical Stroke | | 1CF50 1CF37 1CF0A |
| 133 | 14b | Podchashie Mrachnoye | | 1CF50 1CF30 1CF36 1CF09 |
| 137 | 19 | Podchashie Svetloye | | 1CF50 1CF31 1CF36 1CF09 |
| 118 | 37 | Paraklit | | 1CF52 1CF09 |
| 121 | 41 | Paraklit Mrachny | | 1CF52 1CF30 1CF09 |
| 122 | 38 | Paraklit with Podchashie | | 1CF52 1CF36 1CF09 |
| 122a | | Paraklit with Podchashie | | 1CF52 1CF36 1CF09 1CF13 |
| | 39 | Paraklit with Podchashie with Vertical Stroke | | 1CF52 1CF37 1CF0A |


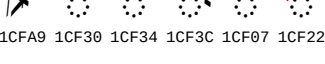
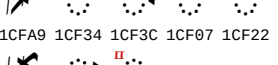









| | | | |
|-----|---|---|--|
| 40 | Paraklit with Podchashie and Kryzh |  |  |
| 75 | 153 Kryuk Klyuchevoy |  |  |
| 156 | Kryuk Klyuchevoy with Borzaya Mark |  |  |
| 155 | Kryuk Klyuchevoy with Sorochya Nozhka |  |  |
| 77 | 158 Kryuk Klyuchevoy with Kryzh and Borzaya |  |  |
| 76 | 157 Kryuk Klyuchevoy with Kryzh |  |  |
| 78 | 159 Kryuk Klyuchevoy with Two Kryzhy |  |  |
| 160 | Kryuk Klyuchevoy with Two Kryzhy |  |  |
| 161 | Kryuk Klyuchevoy with Three Kryzhy |  |  |
| | Zanozhkek (Old style; standard font) |  |  |
| 14 | 27 Zanozhkek (New style variant) |  |  |
| 16 | 31 Zanozhkek Ometny |  |  |
| 15 | 30 Zanozhkek with Kryzh |  |  |
| | 29 Zanozhkek with Kryzh |  |  |
| 19 | 34 Zanozhkek Mrachny |  |  |
| | 33 Zanozhkek Svetly with Kryzh |  |  |
| 184 | 51 Stopitsa |  |  |
| 185 | 47 Stoptisa with Borzaya Mark |  |  |
| 186 | 47b Stopitsa with Udarka Mark |  |  |
| 187 | 48 Stopitsa with Kryzh |  |  |
| 188 | Stopitsa with Kryzh and Borzaya Mark |  |  |
| | 53 Stopitsa with Two Kryzhy |  |  |
| 189 | 54 Stopitsa with Two Kryzhy |  |  |
| | 52 Stopitsa with Two Kryzhy |  |  |
| 190 | 55 Stopitsa with Three Kryzhy |  |  |
| | 57 Stopitsa with Three Kryzhy |  |  |

| | | | | | |
|-----|-----|--|--|--|-------------------------------|
| 123 | 95 | Perevodka | | | 1CF58 1CF14 |
| | 96 | Perevodka with Borzaya Mark | | | 1CF58 1CF14 1CF24 |
| 124 | 97 | Perevodka with Sorochya Nozhka | | | 1CF58 1CF3B 1CF15 |
| 128 | 98 | Perevodka Ometnaya | | | 1CF58 1CF3F 1CF06 1CF08 1CF25 |
| | 100 | Perevodka with Kryzh | | | 1CF58 1CF40 1CF05 1CF10 |
| 125 | 99 | Perevodka with Kryzh | | | 1CF58 1CF40 1CF14 |
| 130 | 107 | Perevodka Nepostoyannaya | | | 1CF59 1CF06 1CF13 |
| 131 | 108 | Perevodka Nepostoyannaya with Sorochya Nozhka | | | 1CF59 1CF3B 1CF04 1CF12 |
| 129 | 109 | Perevodka Nepostoyannoometnaya | | | 1CF59 1CF3F 1CF06 1CF07 1CF12 |
| | | Stopitsa with Sorochya Nozhka (Old Style; standard font) | | | 1CF5A 1CF04 1CF07 |
| 159 | | Stopitsa with Sorochya Nozhka (New Style variant) | | | 1CF5A 1CF04 1CF07 |
| 216 | 49 | Chelyustka | | | 1CF5B 1CF05 |
| 217 | | Chelyustka with Borzaya Mark | | | 1CF5B 1CF05 1CF24 |
| 117 | 5 | Palka | | | 1CF5C 1CF06 |
| 20 | 65 | Zapyataya | | | 1CF5D 1CF07 |
| 21 | | Zapyataya with Borzaya Mark | | | 1CF5D 1CF06 1CF24 |
| 156 | 68 | Sokolitse | | | 1CF5D 1CF3B 1CF06 |
| 4 | | Golubchik | | | 1CF60 1CF05 1CF06 |
| | 66 | Golubchik with Tikhaya Mark | | | 1CF60 1CF23 |
| | 67 | Golubchik with Borzaya Mark | | | 1CF60 1CF24 |
| 12 | 73 | Golubchik Ometny with Borzaya Mark | | | 1CF60 1CF3F 1CF09 1CF0A |
| | 75 | Golubchik with Kryzh | | | 1CF60 1CF40 1CF08 |
| 5 | 76 | Golubchik with Kryzh and Borzaya Mark | | | 1CF60 1CF40 1CF08 1CF24 |
| | 77 | Golubchik with Two Kryzhy and Borzaya Mark | | | 1CF60 1CF40 1CF40 1CF07 |
| 6 | | Golubchik with Two Kryzhy and Borzaya Mark | | | 1CF60 1CF40 1CF40 1CF07 1CF24 |

| | | | | |
|-----|---|--|--|-------------------------------------|
| 7 | Golubchik Svetly | | | 1CF61 1CF07 |
| 82 | Golubchik Svetly with Tikhaya Mark | | | 1CF61 1CF07 1CF23 |
| 83 | Golubchik Svetly with Borzaya Mark | | | 1CF61 1CF07 1CF24 |
| 84 | Golubchik Svetly with Sorochya Nozhka | | | 1CF61 1CF3B 1CF08 |
| 8 | Golubchik Svetlokryzhny | | | 1CF61 1CF40 1CF06 1CF08 1CF13 |
| 8a | Golubchik Svetlokryzhny (variant) | | | 1CF61 1CF40 1CF08 1CF09 1CF0A 1CF13 |
| 85 | Golubchik Svetlokryzhny with Tikhaya Mark | | | 1CF61 1CF40 1CF08 1CF23 |
| 9 | 86 Golubchik Tresvetly | | | 1CF62 1CF05 1CF08 |
| 10 | 87 Golubchik Tresvetly with Sorochya Nozhka | | | 1CF62 1CF3B 1CF05 1CF08 |
| 89 | Golubchik Tresvetloometny with Borzaya | | | 1CF62 1CF3F 1CF05 1CF08 1CF24 |
| 13 | 90 Golubchik Tresvetloometny with Udarka | | | 1CF62 1CF3F 1CF05 1CF08 1CF25 |
| 11 | 88 Golubchik Tresvetly with Kryzh | | | 1CF62 1CF40 1CF05 1CF08 1CF13 |
| 1 | Vrakhiya Mrachnaya | | | 1CF64 1CF07 |
| 2 | 78 Vrakhiya Mrachnaya with Tikhaya Mark | | | 1CF64 1CF07 1CF23 |
| 79 | Vrakhiya Mrachnaya with Borzaya Mark | | | 1CF64 1CF07 1CF24 |
| 80 | Vrakhiya Mrachnaya with Kryzh | | | 1CF64 1CF40 1CF03 1CF04 1CF05 |
| 3 | 81 Vrakhiya Mrachnaya with Kryzh and Tikhaya Mark | | | 1CF64 1CF40 1CF03 1CF04 1CF05 1CF23 |
| 139 | Skameytsa | | | 1CF72 1CF06 |
| 140 | Skameytsa with Podvertka | | | 1CF72 1CF08 1CF26 |
| 118 | Skameytsa with Podvertka | | | 1CF72 1CF08 1CF26 1CF29 |
| 143 | 114 Skameytsa Mrachnaya | | | 1CF72 1CF30 1CF06 1CF07 |
| 141 | 113 Skameytsa with Sorochya Nozhka | | | 1CF72 1CF3B 1CF07 |
| 144 | 116 Skameytsa Nepostoyannaya | | | 1CF73 1CF07 |
| 146 | 119 Skameytsa Mrachnonepostoyannaya | | | 1CF73 1CF30 1CF06 1CF08 |

| | | | | | |
|------|-----|--|--|---|-------------------------------------|
| 145 | 117 | Skameytsa Nepostoyannaya Soroच्या Nozhka | with  |     | 1CF73 1CF3B 1CF07 1CF08 |
| 57 | 210 | Klyuch with Udarka |  |    | 1CF75 1CF08 1CF25 |
| 58 | 212 | Klyuch Mrachny (with Udarka) |  |     | 1CF75 1CF30 1CF08 1CF25 |
| | 211 | Klyuch Zakryty (with Udarka) |  |     | 1CF75 1CF3C 1CF08 1CF25 |
| 59a | | Klyuch with Kryzh |  |     | 1CF75 1CF40 1CF06 1CF0F |
| 59 | 213 | Klyuch with Kryzh (with Udarka) |  |      | 1CF75 1CF40 1CF08 1CF25 1CF11 |
| 147 | 215 | Skameytsa Klyuchevaya |  |    | 1CF76 1CF08 1CF29 |
| 148 | 216 | Skameytsa Klyuchevaya with Podvertka |  |     | 1CF76 1CF08 1CF29 1CF26 |
| 149 | 110 | Skameytsa Dvoyechelnaya |  |  | 1CF7A 1CF07 |
| 150 | 111 | Skameytsa Dvoyechelnaya Soroच्या Nozhka | with  |      | 1CF7A 1CF3B 1CF06 1CF05 1CF06 1CF07 |
| 151 | 112 | Skameytsa Dvoyechelnaya with Podvertka |  |      | 1CF7A 1CF07 1CF06 1CF07 1CF06 1CF26 |
| 154 | 6 | Slozhitie Zakrytoe |  |    | 1CF7F 1CF06 1CF11 |
| 155 | 6b | Slozhitie s Kryzhem |  |   | 1CF80 1CF06 |
| 60 | | Kryzh |  |   | 1CF81 1CF04 |
| 138 | | Rog |  |   | 1CF82 1CF04 |
| 160 | 1 | Statya |  |   | 1CF86 1CF06 |
| 176 | 2 | Statya Mrachnaya |  |    | 1CF86 1CF30 1CF05 |
| 180 | 1b | Statya Svetlaya |  |    | 1CF86 1CF31 1CF08 |
| 183 | | Statya with Zapyataya |  |    | 1CF87 1CF04 1CF0F |
| 177 | 3 | Statya Mrachnaya Polukryzhnaya |  |     | 1CF88 1CF30 1CF06 1CF11 |
| 178 | | Statya Mrachnaya Pristupnaya (Polukryzhnaya) |  |     | 1CF88 1CF30 1CF06 1CF11 |
| 179 | | Statya Mrachnaya with Kryzh |  |     | 1CF88 1CF30 1CF06 1CF11 |
| 177a | | Statya Mrachnaya Polukryzhnaya |  |     | 1CF88 1CF30 1CF06 1CF11 |
| | 4 | Statya Mrachnaya Polukryzhnaya |  |     | 1CF88 1CF30 1CF06 1CF22 |

| | | | | | |
|------|-----|---|---|--|---|
| 195 | 126 | Strela |  |   | 1CF92 1CF06 |
| 198 | 139 | Strela Mrachnaya |  |     | 1CF92 1CF30 1CF06 1CF07 |
| 196 | 127 | Strela with Sorochya Nozhka |  |   | 1CF92 1CF3B 1CF08 |
| 197a | 148 | Strela with Kryzh |  |    | 1CF92 1CF40 1CF05 1CF10 |
| 199 | 149 | Strela Mrachnokryzhnaya with Tikhaya Mark |  |       | 1CF92 1CF40 1CF30 1CF08 1CF22 1CF23 |
| 200 | 150 | Strela Svetlokryzhnaya |  |      | 1CF92 1CF40 1CF31 1CF08 1CF22 1CF13 |
| 202 | | Strela Mrachnotikhaya |  |   | 1CF93 1CF30 1CF07 |
| | 141 | Strela Mrachnotikhaya |  |    | 1CF93 1CF30 1CF07 1CF23 |
| 207 | 138 | Strela Polupovodnaya |  |  | 1CF95 1CF06 |
| 203 | 142 | Strela Povodnaya |  |  | 1CF96 1CF07 |
| 208 | 151 | Strela Poezdnaya |  |   | 1CF96 1CF30 1CF06 |
| | 152 | Strela Poezdnaya |  |   | 1CF96 1CF30 1CF06 |
| 204 | 146 | Strela Kryzhepovodnaya |  |    | 1CF96 1CF40 1CF07 1CF29 |
| 201 | 128 | Strela Tikhaya |  |  | 1CF9A 1CF07 |
| 209a | 129 | Strela Dvoechnaya |  |    | 1CF9B 1CF04 1CF22 1CF06 |
| | 135 | Strela Dvoechnaya with Kryzh |  |    | 1CF9B 1CF40 1CF06 1CF22 1CF07 |
| 211 | 136 | Strela Dvoechnaya with Kryzh and Sorochya Nozhka |  |      | 1CF9B 1CF40 1CF3B 1CF06 1CF22 1CF07 1CF12 |
| | | Mechik; Mechik Prostoy (Old Style; standard font) |  |  | 1CFA7 1CF07 |
| 82 | 137 | Mechik; Mechik Prostoy (New Style variant) |  |  | 1CFA7 1CF06 |
| | | Mechik Klyuchevoy (Old Style; standard font) |  |  | 1CFA9 1CF07 |
| 83 | 232 | Mechik Klyuchevoy (New Style variant) |  |  | 1CFA9 1CF07 |
| | 233 | Mechik Mrachnoklyuchevoy |  |    | 1CFA9 1CF30 1CF08 1CF13 |
| 106 | | Mechik Mrachnoklyuchevoy Ometny |  |    | 1CFA9 1CF30 1CF3F 1CF08 1CF07 |

| | | | | |
|-----|-----|---|---|---|
| 105 | 235 | Mechik Mrachnoklyuchevoy Zakryty |  |  1CFA9 1CF30 1CF3C 1CF08 |
| 109 | 255 | Mechik Mrachnoklyuchevoy Zakryty with Zaderzhka |  |  1CFA9 1CF30 1CF34 1CF3C 1CF07 1CF22 |
| | 254 | Mechik Mrachnoklyuchevoy Zakryty |  |  1CFA9 1CF34 1CF3C 1CF07 1CF22 |
| 84 | 234 | Mechik Klyuchevoy Zakryty |  |  1CFA9 1CF3C 1CF08 |
| 88 | | Mechik Klyuchevoy Ometny |  |  1CFA9 1CF3F 1CF06 |
| | 238 | Mechik Klyuchevoy with Kryzh |  |  1CFA9 1CF40 1CF06 1CF0F |
| 85 | 237 | Mechik Klyuchevoy with Kryzh |  |  1CFA9 1CF40 1CF07 |
| 107 | | Mechik Mrachnoklyuchevoy with Kryzh |  |  1CFA9 1CF40 1CF34 1CF07 |
| | 256 | Mechik Klyuchepovodny |  |  1CFAA 1CF07 |
| | 257 | Mechik Klyuchepovodny |  |  1CFAA 1CF07 |
| 111 | | Mechik Klyuchepovodny |  |  1CFAA 1CF08 1CF06 1CF05 1CF06 |
| | 258 | Mechik Klyuchepovodny |  |  1CFAA 1CF08 1CF07 1CF06 1CF05 1CF06 |
| | 261 | Mechik Klyuchepovodny |  |  1CFAA 1CF08 1CF29 1CF12 |
| 112 | 260 | Mechik Klyuchepovodny with Sorochya Nozhka ¹ |  |  1CFAA 1CF3B 1CF08 |
| | 259 | Mechik Klyuchepovodny with Podvertka |  |  1CFAA 1CF08 1CF26 1CF29 1CF11 |
| 110 | | Mechik Klyuchenepostoyanny |  |  1CFAB 1CF07 1CF06 1CF05 1CF06 1CF07 |
| 114 | 102 | Osoka |  |  1CFB0 1CF08 |
| 116 | | Osoka with Tikhaya |  |  1CFB0 1CF08 1CF23 |
| | 101 | Osoka |  |  1CFB0 1CF08 1CF24 |
| 115 | 103 | Osoka with Kryzh |  |  1CFB0 1CF40 1CF06 1CF07 1CF08 1CF13 |

¹This item in (1) and (2) is erroneously identified as a Mechik Klyuchepovodny with Podvertka (✗).

2.2 Sequences

| (1) | (2) | Disp. | Encoding |
|------|------------------|-------|---|
| 64 | | | 1CF50 1CF06 1CF56 1CF22 |
| | 10 | | 1CF50 1CF08 1CF56 |
| 65 | | | 1CF50 1CF08 1CF56 1CF80 1CF22 |
| 69 | 18 | | 1CF50 1CF31 1CF06 1CF56 |
| 70a | 24 | | 1CF50 1CF31 1CF08 1CF22 1CF5C 1CF07 |
| 70 | | | 1CF50 1CF31 1CF08 1CF5C 1CF22 1CF13 |
| 72 | 17b | | 1CF50 1CF32 1CF09 1CF5C |
| 136 | 25 | | 1CF50 1CF30 1CF36 1CF09 1CF50 1CF30 |
| 135 | 26 | | 1CF50 1CF30 1CF36 1CF08 1CF09 1CF56 1CF08 1CF80 1CF22 |
| 134 | 15 | | 1CF50 1CF30 1CF36 1CF08 1CF09 1CF5C 1CF08 |
| 119a | 44, 45 | | 1CF52 1CF08 1CF56 1CF07 1CF7F 1CF22 |
| 119 | 43 | | 1CF52 1CF08 1CF56 1CF7F 1CF22 |
| 120a | | | 1CF52 1CF08 1CF56 1CF07 1CF80 1CF22 1CF12 |
| 120 | 42 | | 1CF52 1CF08 1CF56 1CF22 1CF80 1CF12 |
| 80 | 164 | | 1CF54 1CF06 1CF50 1CF08 |
| | 165 | | 1CF54 1CF09 1CF50 1CF36 |
| 81 | 166 | | 1CF54 1CF06 1CF50 1CF30 1CF08 1CF22 1CF13 |
| | 168 | | 1CF54 1CF54 1CF06 1CF50 1CF36 1CF0F |
| 79a | | | 1CF54 1CF06 1CF56 |
| 79 | | | 1CF54 1CF06 1CF56 1CF22 |
| | 162 | | 1CF54 1CF08 1CF56 |
| | 167 | | 1CF54 1CF09 1CFA9 1CF40 |
| | 170 ² | | 1CF54 1CF09 1CFA9 1CF3E 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF5C 1CF0E |

²This sequence contains 1 of 5 graphically contracted character forms, accessible via Stylistic Set 3. Always following another neume, they indicate that the melodic structure of these two neumes in conjunction is also contracted or elided.

| | | | |
|------|----|--|---|
| 171 | | | 1CF54 1CF09 1CFA9 1CF3E 1CF5D 1CF07 1CF75 1CF5C 1CF06 |
| 169 | | | 1CF54 1CF24 1CFA9 1CF3E 1CF09 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF86 1CF06 |
| 17 | 35 | | 1CF55 1CF08 1CF56 1CF7F 1CF22 |
| 18 | 36 | | 1CF55 1CF07 1CF08 1CF56 1CF80 1CF22 |
| | 46 | | 1CF55 1CF0B 1CF56 1CF80 1CF22 |
| 205 | | | 1CF56 1CF07 1CF54 1CF40 1CF09 1CF14 |
| 206 | | | 1CF56 1CF35 1CF08 1CF25 1CF54 1CF09 1CFA9 1CF3C |
| 207 | | | 1CF56 1CF35 1CF08 1CF25 1CF54 1CF09 1CFA9 1CF3E 1CF5D 1CF07 |
| 192 | 63 | | 1CF56 1CF06 1CF7F |
| 192a | | | 1CF56 1CF06 1CF7F 1CF22 |
| | 61 | | 1CF56 1CF07 1CF24 1CF7F |
| 192b | 60 | | 1CF56 1CF08 1CF7F 1CF07 1CF12 |
| | 59 | | 1CF56 1CF08 1CF7F 1CF22 |
| 193 | | | 1CF56 1CF08 1CF24 1CF7F |
| 194 | 58 | | 1CF56 1CF08 1CF80 1CF22 |
| 194a | | | 1CF56 1CF09 1CF80 1CF12 |
| 191 | | | 1CF56 1CF08 1CF5C |
| 126 | | | 1CF58 1CF56 1CF40 1CF08 1CF22 |
| 127 | | | 1CF58 1CF09 1CF60 1CF40 1CF40 1CF09 1CF0A 1CF09 1CF08 |
| | 64 | | 1CF56 1CF09 1CF24 1CF5D 1CF7F |
| 153 | | | 1CF5B 1CF09 1CF24 1CF5C 1CF3D |
| 208 | | | 1CF5C 1CF06 1CF54 1CF40 1CF0F |
| | 69 | | 1CF5D 1CF50 1CF08 |
| 37 | | | 1CF5D 1CF04 1CF50 1CF06 1CF56 1CF22 1CF5C 1CF11 |
| | 92 | | 1CF5D 1CF08 1CF52 1CF0A 1CF50 |
| 172 | | | 1CF5D 1CF54 1CF08 |
| 38 | | | 1CF5D 1CF54 1CF09 |

| | | | | |
|-----|-----|--|---|---|
| 179 | | | 1CF5D 1CF04 1CF54 1CF3B 1CF06 | |
| 183 | | | 1CF5D 1CF06 1CF54 1CF3B 1CF08 1CF5D 1CF3B 1CF07 | |
| 182 | | | 1CF5D 1CF09 1CF54 1CF3B 1CF0A 1CF5D 1CF3B 1CF09 | |
| 199 | | | 1CF5D 1CF08 1CF54 1CF3B 1CF0A 1CF5D 1CF50 1CF08 | |
| 200 | | | 1CF5D 1CF08 1CF54 1CF3B 1CF0A 1CF5D 1CF50 1CF30 1CF08 1CF22 | |
| 39 | | | 1CF5D 1CF07 1CF54 1CF3C 1CF08 1CF09 1CF14 | |
| 174 | | | 1CF5D 1CF06 1CF54 1CF30 1CF08 | |
| 54 | | | 1CF5D 1CF06 1CF54 1CF30 1CF15 | |
| 175 | | | 1CF5D 1CF06 1CF54 1CF40 1CF30 1CF09 | |
| 55 | 176 | | | 1CF5D 1CF06 1CF54 1CF40 1CF30 1CF09 1CF14 |
| 180 | | | 1CF5D 1CF06 1CF54 1CF50 1CF08 | |
| 40 | | | 1CF5D 1CF08 1CF54 1CF50 1CF0A | |
| 42 | | | 1CF5D 1CF05 1CF54 1CF07 1CF50 1CF30 1CF22 | |
| 181 | | | 1CF5D 1CF06 1CF54 1CF08 1CF50 1CF30 1CF22 | |
| 32 | 222 | | | 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF50 1CF30 |
| 41 | | | 1CF5D 1CF06 1CF54 1CF50 1CF08 1CF56 1CF80 | |
| 53 | | | 1CF5D 1CF06 1CF54 1CF50 1CF08 1CF56 1CF80 | |
| 44 | | | 1CF5D 1CF54 1CF09 1CF54 1CF25 | |
| 188 | | | 1CF5D 1CF06 1CF54 1CF08 1CF54 1CF40 1CF11 | |
| 45 | 196 | | | 1CF5D 1CF06 1CF54 1CF08 1CF54 1CF22 1CF56 1CF7F 1CF11 |
| 189 | | | 1CF5D 1CF05 1CF54 1CF07 1CF54 1CF3E 1CF05 1CF64 1CF07 | |
| 173 | | | 1CF5D 1CF06 1CF54 1CF56 1CF07 1CF11 | |
| 50 | | | 1CF5D 1CF54 1CF08 1CF56 1CF40 1CF22 | |
| 48 | 186 | | | 1CF5D 1CF06 1CF54 1CF56 1CF08 1CF7F 1CF22 |
| 51 | | | 1CF5D 1CF05 1CF54 1CF07 1CF56 1CF80 1CF22 | |
| 49 | 187 | | | 1CF5D 1CF05 1CF54 1CF07 1CF80 1CF22 |

| | | | | | | | |
|-----------------|------------------|--|--|--|--|--|---|
| 52 | | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CF80 1CF22 |
| 43 | 201 ³ | | | | | | 1CF5D 1CF07 1CF54 1CF09 1CF25 1CFA9 1CF25 |
| | 202 ³ | | | | | | 1CF5D 1CF08 1CF54 1CF0A 1CF25 1CFA9 |
| 46 | | | | | | | 1CF5D 1CF08 1CF54 1CFA9 1CF0A 1CF24 |
| | 198 | | | | | | 1CF5D 1CF09 1CF54 1CF0B 1CFA9 1CF08 1CF5D 1CF3B 1CF0A |
| | 184 | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CFA9 1CF3C |
| | 193 | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CFA9 1CF30 1CF3C 1CF05 1CF12 |
| | 204 ³ | | | | | | 1CF5D 1CF08 1CF54 1CF0A 1CF25 1CFA9 1CF40 1CF13 |
| | 191 | | | | | | 1CF5D 1CF08 1CF54 1CF3E 1CF0A 1CF75 1CF40 1CF13 |
| 47 | | | | | | | 1CF5D 1CF09 1CF54 1CFA9 1CF40 1CF0A |
| | 203 | | | | | | 1CF5D 1CF09 1CF54 1CF0B 1CFA9 1CF40 1CF08 1CF5A 1CF0A |
| | 197 | | | | | | 1CF5D 1CF09 1CF54 1CF0B 1CFA9 1CF40 1CF08 1CF92 1CF30 1CF0A |
| | 194 | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CFA9 1CF30 1CF05 1CF5C 1CF06 |
| | 192 | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CFA9 1CF3E 1CF30 1CF05 1CF5D 1CF06 |
| | 185 | | | | | | 1CF5D 1CF07 1CF54 1CF09 1CFA9 1CF3E 1CF07 1CF60 1CF3F 1CF08 |
| | 190 | | | | | | 1CF5D 1CF05 1CF54 1CF07 1CFA9 1CF3E 1CF05 1CF64 1CF07 |
| | 195 | | | | | | 1CF5D 1CF08 1CF54 1CF0A 1CFA9 1CF08 1CFA9 1CF3C |
| 24 | | | | | | | 1CF5D 1CF24 1CF5C 1CF3D 1CF06 |
| | 217 | | | | | | 1CF5D 1CF09 1CF75 1CF0A 1CF25 |
| 25 | 218 | | | | | | 1CF5D 1CF07 1CF75 1CF3C 1CF08 1CF25 |
| | 219 | | | | | | 1CF5D 1CF07 1CF75 1CF3E 1CF08 1CF25 1CF5D |
| 36 ³ | 229 | | | | | | 1CF5D 1CF07 1CF75 1CF3E 1CF08 1CF25 1CF7B 1CF3B 1CF29 1CF13 |
| 34 ³ | | | | | | | 1CF5D 1CF07 1CF75 1CF3E 1CF08 1CF24 1CF7B 1CF3B 1CF29 1CF13 |
| | 230 ³ | | | | | | 1CF5D 1CF07 1CF75 1CF3E 1CF08 1CF25 1CF7B 1CF3B 1CF29 1CF13 |
| 35 ³ | | | | | | | 1CF5D 1CF07 1CF75 1CF3E 1CF08 1CF24 1CF7B 1CF3B 1CF29 1CF13 |

³See footnote 2.

| | | | |
|-----|-----|--|---|
| 26 | | | 1CF5D 1CF07 1CF75 1CF3F 1CF08 1CF25 |
| 28 | 228 | | 1CF5D 1CF07 1CF75 1CF40 1CF08 1CF25 1CF11 |
| 31 | 220 | | 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF50 |
| 33 | 221 | | 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF50 1CF36 1CF11 |
| 27 | 223 | | 1CF5D 1CF06 1CF75 1CF07 1CF25 1CF56 |
| | 231 | | 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF56 1CF7F 1CF5A 1CF07 1CF24 |
| | 227 | | 1CF5D 1CF06 1CF75 1CF07 1CF5C 1CF05 |
| | 226 | | 1CF5D 1CF08 1CF75 1CF09 1CF24 1CF5C 1CF07 |
| 29a | | | 1CF5D 1CF08 1CF75 1CF09 1CF25 1CF5C 1CF07 |
| 29 | | | 1CF5D 1CF09 1CF75 1CF0A 1CF24 1CF5C 1CF08 |
| | 225 | | 1CF5D 1CF07 1CF75 1CF08 1CF7D |
| 30 | 224 | | 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF86 1CF06 |
| 22 | 91 | | 1CF5D 1CF7F 1CF06 |
| 23 | | | 1CF5D 1CF24 1CF7F 1CF06 |
| 56 | 145 | | 1CF5D 1CF06 1CF96 1CF13 |
| 157 | 70 | | 1CF5D 1CF3B 1CF08 1CF7F 1CF22 |
| 158 | 71 | | 1CF5D 1CF3B 1CF08 1CF80 1CF22 |
| | 72 | | 1CF5D 1CF3B 1CF08 1CF80 1CF22 1CF13 |
| | 74 | | 1CF60 1CF5C 1CF09 |
| | 93 | | 1CF61 1CF08 1CF23 1CF50 1CF0A 1CF56 1CF5C 1CF07 |
| | 94 | | 1CF61 1CF08 1CF23 1CF79 1CF0A 1CF50 1CF5C 1CF07 |
| 142 | 122 | | 1CF72 1CF08 1CF29 1CFA9 1CF50 1CF36 1CF11 |
| | 123 | | 1CF72 1CF06 1CF29 1CFA9 1CF50 1CF36 1CF03 1CF50 |
| | 125 | | 1CF72 1CF08 1CF29 1CFA9 1CF50 1CF36 1CF05 1CF50 |
| | 214 | | 1CF75 1CF3E 1CF08 1CF25 1CF5D |
| 152 | 124 | | 1CF7A 1CF06 1CF29 1CFA9 1CF50 1CF36 1CF0F |
| | 209 | | 1CF86 1CF07 1CF54 1CF3E 1CF22 1CF61 1CF07 |

| | | | | |
|------|-----|--|---|---|
| 303 | | | 1CF86 1CF07 1CF75 1CF3E 1CF22 1CF25 1CF5D 1CF05 1CF54 1CF3B 1CF07 | |
| 298 | | | 1CF86 1CF08 1CF75 1CF22 1CFA9 1CF3C 1CF11 | |
| 161 | | | 1CF86 1CF0A 1CFA9 | |
| 162 | 299 | | | 1CF86 1CF08 1CFA9 1CF3C 1CF22 |
| 308 | | | 1CF86 1CF0A 1CFA9 1CF3E 1CF22 1CF5D 1CF08 1CF54 1CF3B 1CF0A | |
| 307 | | | 1CF86 1CF07 1CFA9 1CF3E 1CF64 1CF05 1CF07 | |
| 163 | | | 1CF86 1CF07 1CFA9 1CF40 | |
| 166 | | | 1CF86 1CF08 1CFA9 1CF50 1CF36 | |
| 306 | | | 1CF86 1CF08 1CFA9 1CF22 1CF50 1CF36 1CF11 1CF50 1CF07 | |
| 164 | 302 | | | 1CF86 1CF0A 1CFA9 1CF22 1CF56 1CF08 |
| 165 | 301 | | | 1CF86 1CF07 1CFA9 1CF22 1CF5C 1CF04 |
| 305 | | | 1CF86 1CF08 1CFA9 1CF22 1CF06 1CFA9 1CF3C 1CF05 1CF10 | |
| 304 | | | 1CF86 1CF0A 1CFA9 1CF22 1CFA9 1CF3E 1CF08 1CF5D 1CF06 | |
| 167 | 300 | | | 1CF86 1CF0A 1CFA9 1CF30 1CF3C 1CF22 |
| 167a | | | 1CF86 1CF08 1CFA9 1CF34 1CF3C | |
| 310 | | | 1CF86 1CF0A 1CFA9 1CF34 1CF3F 1CF22 1CF22 1CF14 | |
| 168 | | | 1CF86 1CF0A 1CFA9 1CF34 1CF3F 1CF22 1CF22 1CF14 | |
| 170 | | | 1CF86 1CF08 1CFA9 1CF34 1CF40 1CF22 1CF22 | |
| 171 | 313 | | | 1CF86 1CF08 1CFA9 1CF34 1CF22 1CF22 1CF50 |
| 172 | 315 | | | 1CF86 1CF08 1CFA9 1CF34 1CF22 1CF22 1CF50 1CF30 |
| 173 | 314 | | | 1CF86 1CF08 1CFA9 1CF34 1CF22 1CF22 1CF50 1CF36 1CF11 |
| 169 | | | 1CF86 1CF07 1CFA9 1CF34 1CF22 1CF22 1CF5C 1CF05 | |
| 309 | | | 1CF86 1CF07 1CFA9 1CF34 1CF22 1CF5C 1CF05 | |
| 316 | | | 1CF86 1CF0A 1CFA9 1CF34 1CF22 1CFA9 1CF3C 1CF08 | |
| 174 | | | 1CF86 1CF08 1CFA9 1CF34 1CFA9 1CF40 | |
| 175 | | | 1CF86 1CF0A 1CFA9 1CF30 1CF34 1CF3C 1CF09 | |
| 312 | | | 1CF86 1CF0A 1CFA9 1CF30 1CF34 1CF3C 1CF22 1CF22 1CF09 | |

| | | | |
|-----|-----|--|---|
| 181 | | | 1CF86 1CF31 1CF08 1CFA9 1CF50 1CF36 |
| 182 | | | 1CF86 1CF31 1CF0A 1CFA9 1CF40 1CF34 |
| 206 | | | 1CF96 1CF05 1CF06 1CF07 1CF50 |
| 143 | | | 1CF96 1CF07 1CF50 |
| 205 | 144 | | 1CF96 1CF04 1CF29 1CF56 |
| 131 | | | 1CF9B 1CF04 1CF22 1CF06 1CF50 |
| 213 | | | 1CF9B 1CF09 1CF22 1CF0A 1CF50 |
| 215 | 133 | | 1CF9B 1CF04 1CF22 1CF06 1CF50 1CF30 |
| 214 | 132 | | 1CF9B 1CF04 1CF22 1CF06 1CF50 1CF36 |
| 212 | 130 | | 1CF9B 1CF04 1CF22 1CF06 1CF56 |
| 284 | | | 1CFA9 1CF3E 1CF0A 1CF14 1CF54 1CF24 1CFA9 1CF09 1CF5C 1CF07 |
| 245 | | | 1CFA9 1CF3E 1CF06 1CF5D |
| 246 | | | 1CFA9 1CF3E 1CF30 1CF08 1CF5D 1CF07 |
| 95 | | | 1CFA9 1CF3E 1CF07 1CF06 1CF5D 1CF05 1CF54 1CF3B 1CF06 1CF07 |
| 273 | | | 1CFA9 1CF3E 1CF07 1CF5D 1CF05 1CF54 1CF3B 1CF07 |
| 290 | | | 1CFA9 1CF3E 1CF07 1CF5D 1CF05 1CF54 1CF3B 1CF07 |
| 271 | | | 1CFA9 1CF3E 1CF0A 1CF5D 1CF08 1CF54 1CF3B 1CF0A 1CF5D 1CF50 1CF08 |
| 272 | | | 1CFA9 1CF3E 1CF0A 1CF5D 1CF08 1CF54 1CF3B 1CF0A 1CF5D 1CF3B 1CF08 |
| 297 | | | 1CFA9 1CF3E 1CF09 1CF5D 1CF07 1CF75 1CF08 1CF25 1CF92 1CF06 |
| 103 | 291 | | 1CFA9 1CF3E 1CF06 1CF62 1CF04 1CF07 |
| 293 | | | 1CFA9 1CF3E 1CF08 1CF62 1CF3F 1CF06 1CF09 |
| 104 | | | 1CFA9 1CF3E 1CF08 1CF62 1CF3F 1CF06 1CF09 1CF14 |
| 292 | | | 1CFA9 1CF3E 1CF08 1CF62 1CF3F 1CF06 1CF09 1CF25 |
| 289 | | | 1CFA9 1CF3E 1CF08 1CF62 1CF3F 1CF06 1CF09 |
| 288 | | | 1CFA9 1CF3E 1CF08 1CF64 1CF05 1CF07 1CF23 |

| | | | | | | | | | | | | | |
|------------------|------------------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 101 | 266 ⁴ | | 1CFA9 | 1CF3E | 1CF08 | 1CF25 | 1CF7B | 1CF3B | 1CF25 | 1CF13 | | | |
| 102 | 265 | | 1CFA9 | 1CF3E | 1CF08 | 1CF25 | 1CF7B | 1CF3B | 1CF25 | 1CF13 | | | |
| | 263 ⁵ | | 1CFA9 | 1CF08 | 1CFAB | 1CF13 | | | | | | | |
| | 264 ⁵ | | 1CFA9 | 1CF08 | 1CF29 | 1CFAB | 1CF3B | 1CF13 | | | | | |
| 113 | | | 1CFA9 | 1CF3E | 1CF08 | 1CF77 | 1CF3B | 1CF25 | 1CF13 | | | | |
| 100 ⁶ | | | 1CFA9 | 1CF3E | 1CF08 | 1CF7A | 1CF06 | 1CF07 | 1CF26 | | | | |
| 90 | 248 | | 1CFA9 | 1CF08 | 1CF50 | | | | | | | | |
| 93 | 249 | | 1CFA9 | 1CF08 | 1CF50 | 1CF30 | 1CF06 | | | | | | |
| 91 | 247 | | 1CFA9 | 1CF06 | 1CF50 | 1CF36 | 1CF0F | | | | | | |
| | 251 | | 1CFA9 | 1CF07 | 1CF50 | 1CF36 | 1CF10 | 1CF56 | 1CF06 | | | | |
| 92 | 250 | | 1CFA9 | 1CF08 | 1CF50 | 1CF36 | 1CF50 | 1CF06 | | | | | |
| | 244 | | 1CFA9 | 1CF06 | 1CF56 | | | | | | | | |
| | 242 | | 1CFA9 | 1CF08 | 1CF56 | | | | | | | | |
| 86 | | | 1CFA9 | 1CF0A | 1CF56 | | | | | | | | |
| | 274 | | 1CFA9 | 1CF08 | 1CF56 | 1CF06 | 1CF54 | 1CF50 | 1CF07 | | | | |
| | 281 | | 1CFA9 | 1CF09 | 1CF56 | 1CF07 | 1CF54 | 1CF24 | 1CF50 | 1CF0A | | | |
| | 282 | | 1CFA9 | 1CF09 | 1CF56 | 1CF07 | 1CF54 | 1CF24 | 1CF50 | 1CF0A | | | |
| | 276 | | 1CFA9 | 1CF08 | 1CF56 | 1CF06 | 1CF54 | 1CF22 | 1CF08 | 1CF50 | 1CF30 | 1CF22 | |
| | 275 | | 1CFA9 | 1CF08 | 1CF56 | 1CF06 | 1CF54 | 1CF50 | 1CF36 | 1CF07 | | | |
| | 277 | | 1CFA9 | 1CF0A | 1CF56 | 1CF08 | 1CF54 | 1CF24 | 1CF54 | 1CF3E | 1CF09 | 1CF5D | 1CF07 |
| | 280 | | 1CFA9 | 1CF0A | 1CF56 | 1CF08 | 1CF54 | 1CF09 | 1CF24 | 1CFA9 | 1CF3C | 1CF13 | |
| | 278 | | 1CFA9 | 1CF0A | 1CF56 | 1CF08 | 1CF54 | 1CF24 | 1CFA9 | 1CF09 | 1CF50 | | |
| | 279 | | 1CFA9 | 1CF0A | 1CF56 | 1CF08 | 1CF54 | 1CF24 | 1CFA9 | 1CF09 | 1CF50 | 1CF36 | 1CF13 |
| | 283 | | 1CFA9 | 1CF0A | 1CF56 | 1CF08 | 1CF54 | 1CF24 | 1CFA9 | 1CF09 | 1CF5C | 1CF07 | |

⁴This item in (1) and (2) is erroneously recorded with a Skameytsa with Podvertka (♯).

⁵See footnote 2.

⁶This item in (1) and (2) was recorded with a Skameytsa with Podvertka (♯), and appears to be incorrect. (As documented, the Podvertka should be a Sorochya Nozhka.) However, it may possibly be correct, and the wrong pitch marks were provided.

| | | | |
|-----|-----|--|---|
| 87 | | | 1CFA9 1CF07 1CF56 1CF7F |
| 252 | | | 1CFA9 1CF08 1CF56 1CF07 1CF7F 1CF11 |
| 98 | | | 1CFA9 1CF08 1CF58 1CF3F |
| 97 | 285 | | 1CFA9 1CF08 1CF59 1CF07 |
| 99 | | | 1CFA9 1CF08 1CF59 1CF3F 1CF06 1CF07 |
| 287 | | | 1CFA9 1CF08 1CF59 1CF3F 1CF06 1CF09 |
| 286 | | | 1CFA9 1CF08 1CF25 1CF59 1CF3F 1CF06 1CF07 |
| 267 | | | 1CFA9 1CF07 1CF5A 1CF07 |
| 268 | | | 1CFA9 1CF0A 1CF5A 1CF0A |
| 270 | | | 1CFA9 1CF0A 1CF5A 1CF0A |
| 269 | | | 1CFA9 1CF3C 1CF0A 1CF5A 1CF0A |
| 89 | 240 | | 1CFA9 1CF06 1CF5C 1CF04 |
| 89a | 240 | | 1CFA9 1CF07 1CF5C 1CF04 |
| 253 | | | 1CFA9 1CF34 1CF07 1CF22 1CF5C 1CF05 |
| 108 | | | 1CFA9 1CF34 1CF07 1CF22 1CF5C 1CF05 |
| 295 | | | 1CFA9 1CF08 1CFA9 1CF10 |
| 296 | | | 1CFA9 1CF08 1CFA9 1CF11 |
| 96 | 294 | | 1CFA9 1CF08 1CFA9 1CF06 1CF10 |
| 262 | | | 1CFA9 1CF08 1CF06 1CFAB 1CF07 |

Appendix 3 Priznakified Forms of Neumes

3.1 Glyphs with Two Priznakified Forms

The following characters have two priznakified forms, a form used at the second level of a soglasie (on the pitches *nizko* and *povyshe*), accessed via U+1CF42 Znamenny Priznak Modifier Level 2, and a form used at the third level of a soglasie (on the pitches *sredne* and *vysoke*), accessed via U+1CF43 Znamenny Priznak Modifier Level 3. In the alternative priznaki system of Morozov, the neumes may also have a variant (“flipped”) form: a flipped form that occurs at the pitch *povyshe* (accessed by invoking the control characters U+1CF42 Znamenny Priznak Modifier Level 2 U+1CF44 Znamenny Priznak Modifier Flip) and a flipped form that occurs at the pitch *vysoke* (accessed by invoking the control characters U+1CF43 Znamenny Priznak Modifier Level 3 U+1CF44 Znamenny Priznak Modifier Flip). All characters have only two priznaki in Kazan Notation, a lower form (accessed via U+1CF45 Znamenny Priznak Modifier Kryzh) and an upper form (accessed via U+1CF46 Znamenny Priznak Modifier Rog). The only exception is U+1CF56 Znamenny Neume Stopitsa, which has an additional “flipped” form bearing the Rog priznak, accessed via U+1CF46 Znamenny Priznak Modifier Rog U+1CF44 Znamenny Priznak Modifier Flip. Many forms are theoretically impossible, or unattested, and so are not included.

| | $\boxed{\text{P2}}$ 1CF42 | $\boxed{\text{P3}}$ 1CF43 | $\boxed{\text{P2}}\boxed{\text{PU}}$ 1CF42 1CF44 | $\boxed{\text{P3}}\boxed{\text{PU}}$ 1CF43 1CF44 | $\boxed{\text{PK}}$ 1CF45 | $\boxed{\text{PR}}$ 1CF46 | $\boxed{\text{PR}}\boxed{\text{PU}}$ 1CF46 1CF44 |
|-------|------------------------------|------------------------------|---|---|------------------------------|------------------------------|---|
| 1CF50 | | | | | | | |
| 1CF51 | | | | | - | - | |
| 1CF52 | | | - | - | | - | |
| 1CF53 | | | | | - | - | |
| 1CF54 | | | | | | | |
| 1CF56 | | | | | | | |
| 1CF57 | | | | | | | |
| 1CF58 | - | - | - | - | | | |
| 1CF59 | - | - | - | - | | | |
| 1CF5B | | | | | | | |
| 1CF5C | | | | | | - | |
| 1CF60 | - | - | - | - | | | |
| 1CF61 | - | - | - | - | | | |
| 1CF62 | - | - | - | - | | | |
| 1CF63 | - | - | - | - | | | |
| 1CF64 | - | - | - | - | | | |
| 1CF65 | - | - | - | - | | | |
| 1CF66 | - | - | - | - | | | |



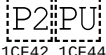
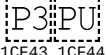



































































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| | P2 1CF42 | P3 1CF43 | P2:PU 1CF42 1CF44 | P3:PU 1CF43 1CF44 | PK 1CF45 | PR 1CF46 | PR:PU 1CF46 1CF44 |
|-------|-------------|-------------|----------------------|----------------------|-------------|-------------|----------------------|
| 1CF67 | - | - | - | - | | | |
| 1CF68 | - | - | - | - | | | |
| 1CF69 | - | - | - | - | | | |
| 1CF6A | - | - | - | - | | | |
| 1CF6D | | | | - | - | - | |
| 1CF70 | | | - | - | - | - | |
| 1CF71 | | | - | - | | - | |
| 1CF72 | | | - | - | | - | |
| 1CF73 | | | - | - | | - | |
| 1CF74 | | | | | - | - | |
| 1CF79 | - | - | - | - | | - | |
| 1CF7A | - | - | - | - | | - | |
| 1CF7B | - | - | - | - | | - | |
| 1CF7C | - | - | - | - | | - | |
| 1CF81 | | | - | - | - | - | |
| 1CF82 | | | - | - | - | - | |
| 1CF86 | | | - | - | | | |
| 1CF87 | | | - | - | - | - | |
| 1CF88 | | | - | - | - | - | |
| 1CF89 | | | - | - | - | - | |
| 1CF8B | | | - | - | - | - | |
| 1CF90 | | | - | - | - | - | |
| 1CF92 | | | | - | | | |
| 1CF93 | | | | - | - | - | |
| 1CF94 | | | | - | | | |
| 1CF95 | | | | - | | | |
| 1CF96 | | | | - | | | |
| 1CF97 | | | | - | | | |



































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| |  P2 1CF42 |  P3 1CF43 |  P2:PU 1CF42 1CF44 |  P3:PU 1CF43 1CF44 |  PK 1CF45 |  PR 1CF46 |  PR:PU 1CF46 1CF44 |
|--|---|---|--|--|--|---|--|
|  1CF98 | - | - | - | - |  |  | |
|  1CF99 | - | - | - | - |  |  | |
|  1CF9B | - | - | - | - |  |  | |
|  1CF9C | - | - | - | - |  |  | |
|  1CF9D | - | - | - | - |  |  | |
|  1CF9E | - | - | - | - |  |  | |
|  1CF9F | - | - | - | - |  |  | |
|  1CFA2 |  |  | - | - | - | - | |
|  1CFA3 |  |  | - | - | - | - | |
|  1CFA5 |  |  | - | - | - | - | |
|  1CFA6 |  |  | - | - | - | - | |
|  1CFA7 |  |  | - | - | - | - | |
|  1CFA8 | - | - | - | - |  | - | |
|  1CFA8 (ss02) | - | - | - | - |  | - | |
|  1CFA9 | - | - | - | - |  | - | |
|  1CFAA | - | - | - | - |  | - | |
|  1CFAB | - | - | - | - |  | - | |
|  1CFAA (ss02) | - | - | - | - |  | - | |
|  1CFAB (ss02) | - | - | - | - |  | - | |
|  1CFAC | - |  | - | - | - | - | |
|  1CFAD | - |  | - | - | - | - | |
|  1CFAE | - |  | - | - | - | - | |
|  1CFAF |  |  | - | - | - | - | |
|  1CFB0 | - | - | - | - |  | - | |
|  1CFB3 | - | - | - | - |  | - | |
|  1CFB4 | - | - | - | - |  | - | |
|  1CFC3 |  |  | - | - | - | - | |







































































3.2 Glyphs with Non-standard Priznakified Forms

In the system of Morozov, two characters have a priznakified form at the first level of the *svetloe* soglasie (on the pitch *malo povyshe*), and sometimes at the first level of the *tresvetloye* soglasie (on the pitch *malo povyshe s khokhlom*). These two forms are accessed by “flipping” the non-priznakified base character form (via U+1CF44 Znamenny Priznak Modifier Flip). The Demestvenny Mechiki used in the system of Kalashnikov (the “new style” forms) also take a priznak at these pitches, in addition to the flipped versions of the Level 2 and Level 3 priznakified forms. All of these glyphs also have only two priznakified forms in Kazan Notation, a lower form (accessed via U+1CF45 Znamenny Priznak Modifier Kryzh) and an upper form (accessed via U+1CF46 Znamenny Priznak Modifier Rog).

| |  1CF42 |  1CF43 |  1CF44 |  1CF42 1CF44 |  1CF43 1CF44 |  1CF44 1CF44 |  1CF45 |  1CF46 |
|---|--|--|--|--|--|---|--|--|
|  1CF5D |  |  |  | — | — |  |  |  |
|  1CF7E |  |  |  | — | — | — | — | — |
|  1CFA7 (ss02) |  |  |  |  |  | — |  |  |
|  1CFA9 (ss02) |  |  |  |  |  | — |  | — |

3.3 Ligatures

Some ligatures exhibit complex priznakification: the priznak may be positioned on one component for one level and on the other component on another level. Font designers need to provide pre-composed glyphs for these forms.

| |  1CF42 |  1CF43 |  1CF42 1CF44 |  1CF43 1CF44 |  1CF45 |  1CF46 |
|--|--|--|--|--|--|--|
|  1CF86 |  |  |  | — | — | — |
|  1CF30 |  |  |  | — | — | — |
|  1CF86 |  |  |  | — | — | — |
|  1CF31 |  |  |  | — | — | — |
|  1CF86 |  |  |  |  | — | — |
|  1CF85 |  |  |  |  | — | — |
|  1CF86 |  |  | — | — | — | — |
|  1CF85 |  |  | — | — | — | — |
|  1CF87 |  |  |  | — | — | — |
|  1CF30 |  |  |  | — | — | — |
|  1CF88 |  |  |  | — | — | — |
|  1CF30 |  |  |  | — | — | — |
|  1CF88 |  |  |  | — | — | — |
|  1CF30 |  |  |  | — | — | — |
|  1CF90 |  |  |  | — | — | — |
|  1CF30 |  |  |  | — | — | — |

**ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹**

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://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 <http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. Title: Proposal to Encode Znamenny Musical Notation in Unicode

2. Requester's name: Aleksandr Andreev and Nikita Simmons

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

4. Submission date: 04/17/2019

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: Znamenny Musical Notation

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: 186

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

A-Contemporary B.1-Specialized (small collection) 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? Aleksandr Andreev

b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): Aleksandr.andreev@gmail.com; https://sci.ponomar.net/

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)? YES

See sections 2.2 and 2.3

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.

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)

C. Technical - Justification

| | |
|--|---|
| 1. Has this proposal for addition of character(s) been submitted before? | YES |
| If YES explain | <i>This is a revised version, based on feedback from Script Ad-Hoc.</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.)? | YES |
| If YES, with whom? | <i>Proposal was presented at conferences on medieval Russian musicology and posted for scholarly review on academia.edu</i> |
| If YES, available relevant documents: | <i>E-mail correspondence and web comments</i> |
| 3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? | YES |
| Reference: | <i>Section 1.4 and Section 1.5</i> |
| 4. The context of use for the proposed characters (type of use; common or rare) | Rare |
| Reference: | <i>See Sections 1.1 through 1.3</i> |
| 5. Are the proposed characters in current use by the user community? | YES |
| If YES, where? Reference: | <i>Russian Orthodox Church; see Section 1.4</i> |
| 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? | N/A |
| 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? | YES |
| If YES, is a rationale for such use provided? | YES |
| If YES, reference: | <i>See Section 2.1</i> |
| Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? | YES |
| If YES, reference: | <i>See Appendices</i> |
| 12. Does the proposal contain characters with any special properties such as control function or similar semantics? | YES |
| If YES, describe in detail (include attachment if necessary) | <i>See Section 2.1 describing use of Control Characters. See Appendix 3 for examples.</i> |
| 13. Does the proposal contain any Ideographic compatibility characters? | NO |
| If YES, are the equivalent corresponding unified ideographic characters identified? | |
| If YES, reference: | |