Slavonic Computing Initiative Shafarik Unicode Font Documentation

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The Shafarik¹ Unicode font, named after Pavel Jozef Šafárik (1795–1861), Slovak-born scholar and one of the founders of modern Slavic philology, is a specialized font intended for an academic presentation of **Old Church Slavonic (OCS)** texts written in both the Cyrillic or Glagolitic alphabets.² Since OCS texts have several differences in presentation from the methodology used for later **Church Slavonic (CS)** texts, the user should become familiar with these particular details of font usage.

One of the convenient flexible features of the Shafarik font is the ability to graphically represent variant letter forms without changing the base values of individual letters. This allows for more accurately reproducing OCS texts where there is a diversity of textual forms, without sacrificing the ability to alphabetically sort the text or search for a word using base letter values. This is accomplished by typesetting a letter (or number) or even a whole word or paragraph, and then applying a **Stylistic Set** (ss01, ss02, etc.) or a **Stylistic Alternate** (salt). (In LibreOffice, in the small window at the top which displays the active font "Shafarik", one can apply the Stylistic Sets or Stylistic Alternate by adding a suffix, so that the font name is changed to "Shafarik:ss01", "Shafarik:ss02" or "Shafarik:salt", etc.)

Since the Cyrillic and Glagolitic alphabet scripts each have their own specific characteristics, this documentation will be divided into two parts.

PART 1: CYRILLIC

1. Numbers

One of the most notable differences between OCS and CS typography is the formation or composition of numerals, which are derived from the forms of Byzantine Greek numerals. The numerals are divided into lower and higher numerals, with the "teens" being an exceptional category. (Please note that the formation of numbers in the Glagolitic script is more complex and variable than the Cyrillic numbers, and there is not a consistent correspondence of letter values used in the two systems. Glagolitic numbers are treated as a separate system.)

1.i. The Lower Numerals (1-999, except the "Teens")

Lower numerals in OCS Cyrillic texts can be typeset in two different ways, using either the **Titlo** or **Vzmet** symbol.³ It is strongly advised that the user should closely examine the original manuscript or text source to determine which symbol is authentically used. While the use of one symbol over another

¹⁾ The stress is placed on the first syllable, Shafarik. See: Словарь собственных имён русского языка. Ed. by F. Algeenko. Moscow, 2010.

²⁾ The initial design of this font was based on several freeware fonts available on the Internet, but all original designs have undergone significant development during the course of our work with a wide variety of period manuscripts and incunabula.

³⁾ Unicode considers U+0483 Combining Cyrillic Titlo and U+A66F Combining Cyrillic Vzmet to be functionally equivalent, differing only in their visual appearance: [stress stress] (see Section 7.4 of the Unicode standard: "In Old Church Slavonic manuscripts, ... pokrytie, titlo, and its archaic typographical alternate vzmet are all used more or less interchangeably"). Note that while the Titlo (stress) is used in both OCS and CS typography, the Vzmet (stress) should only be used with OCS texts.

may not be semantically different, we should always strive to avoid introducing an anachronistic feature into a period text.

In the majority of OCS period manuscripts, the Titlo or Vzmet symbol is stretched all the way across three or four letters in the formation of larger numbers. (*This feature will be presented below.*)

- a) Using the Combining Cyrillic Titlo: U+0483 & OCS numerals can be formed with the Titlo symbol in the same manner as they are typeset in later CS texts.
- b) Using the Combining Cyrillic Vzmet: U+A66F of . In general, OCS numbers are more commonly formed by using the Vzmet symbol.

OCS numerals between 1 and 9,999 are often bounded or enclosed by the Middle Dot (U+00B7 Middle Dot \cdot). The use of the Middle Dot as a number marker is not attested with numbers above 9,999.

The following lower case letters are used as numerals when they are presented together with the Vzmet, and are enclosed by the Middle Dot. Note the historical variant forms for some letters.

1	· a ·	10	.ïï.	100	· p ·
2	• <u>R</u> •	20	·ĸ.	200	· c ·
3	·ř·	30	·X.	300	$\cdot \overrightarrow{\mathbf{T}}$.
4	· ⊼ ·	40	·M·	400	$\cdot \vec{\mathbf{v}} \cdot \cdot \vec{\mathbf{v}} \cdot$
5 ⁴	$\cdot \stackrel{\mathbf{c}}{\mathbf{\epsilon}} \cdot$	50	·N·	500	$\cdot \overrightarrow{\Phi} \cdot$
6	$\cdot \ddot{5} \cdot \cdot \ddot{5} \cdot$	60	•3.	600	$\cdot \overset{\smile}{\mathbf{x}} \cdot$
7	$\cdot \ddot{\mathbf{z}} \cdot \cdot \ddot{3} \cdot$	70	$\cdot \overset{\mathbf{o}}{\mathbf{o}} \cdot$	700	· ¼ ·
8	· Й ·	80	·ñ·	800	$\cdot \ddot{\mathbf{\omega}} \cdot \cdot \ddot{\mathbf{\omega}} \cdot$
9	•₩•	90	$\cdot \ddot{\mathbf{Y}} \cdot \cdot \ddot{\mathbf{q}} \cdot \cdot \ddot{\mathbf{c}} \cdot$	900 ⁵	$\cdot \overrightarrow{\mu} \cdot \cdot \overrightarrow{\mathbf{A}} \cdot \cdot \cdot \overrightarrow{\mathbf{A}} \cdot \cdot \cdot \mathbf{A} \cdot$

In the cases where the Titlo or Vzmet in numerals needs to balance across multiple characters, the font offers some solutions.

a) Titlo or Vzmet over Two Characters. For 2-letter numeric formations, a double version of the Titlo or Vzmet may be used. Though Unicode does not encode a double titlo or a double vzmet, we have encoded these glyphs as follows: for a double titlo, use U+0360 Combining Double Tilde; for a double vzmet, use U+0361 Combining Double Inverted Breve. Note that the combining character is placed between the two letters.

Titlo: 2-letter ·TM·	Vzmet: 2-letter ·TM·	
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⁴⁾ OCS uses U+0435 Cyrillic Small Letter Ie " ϵ " for the numbers 5, 15, etc., rather than the wide " ϵ " (U+0454 Cyrillic Small Letter Ukrainian Ie) which is used in modern CS texts.

⁵⁾ The alternate letter used for the numeral 900 represents the influence of the Glagolitic script. "a" is a Stylistic Alternate (*salt*) of the letter "a" (U+A659 Cyrillic Small Letter Closed Little Yus).

b) For Titlo over Multiple Characters. Combining characters spanning three and four letters are not encoded in Unicode. However, Unicode encodes portions (components) that can be placed over each individual character. To form a "multiple" titlo, U+FE2E Combining Cyrillic Titlo Left Half is placed over the first letter, U+FE26 Combining Conjoining Macron is placed over any middle characters, and U+FE2F Combining Cyrillic Titlo Right Half is placed over the last character:

$$a + \overline{\circ}$$
 (titlo left half) + $B + \overline{\circ}$ (conjoining macron) + $\Gamma + \overline{\circ}$ (titlo right half) $\rightarrow \overline{ABF}$

This method can often produce poor results, especially if the characters under the titlo have different heights or widths. **Note**: There is also at present no method to display a vzmet (rather than a tilto) over multiple characters. **Note Further**: The implementation of Titlo Halves in LibreOffice seems to be buggy.

c) "Fall-back" Solutions. It is possible to use the standard default Titlo or Vzmet symbol, placed over only *one* of the letters (as in later CS usage), or over *each* of the letters (although this solution tends to look "amateurish"). For example:

1.ii. The "Teens" (11-19)

The numerals 11-19 in OCS texts are typeset in the same manner as in modern CS, with the numeral 10 following the lower numbers.

Note that where CS fonts place a Titlo over the first of the two letters, OCS stretches the Vzmet so that it balances evenly over both letters, using a system of contextual substitution lookups that are built into the font so that the user doesn't need to be concerned with their implentation $(\bar{a} + \bar{b} + \bar{\iota} \to \bar{\mu})$. (The Cyrillic "teens" are the only set of double letters in the Shafarik font which are provided with precomposed forms which include the Vzmet.)

11 · \(\vec{\lambda} \) i	14 · ∏i ·	17 · z i· ·3i·
12 · Ki ·	15 ⋅€Í ⋅	18 ∙Йі∙
13 ·Fi∙	16 ⋅รีเ∙ ะสี∙	19 · ⊕i ∙

NB: in the rare instance if the user does not want the vzmet to automatically stretch over the characters $(\bar{\mathbf{u}})$, the character U+200C Zero Width Non Joiner may be inserted between the characters to prevent ligation.

1.iii. The Higher Numerals (1,000 and above)

Most of the higher numbers have variant historical forms, since there was a lack of consensus and uniformity in the presentation of these infrequently-used (and often theoretical) numerals. These alternative forms are provided via Stylistic Sets (ss01 and ss02). [NOTE: The use of the Stylistic Sets is the preferred method of text display, as these pre-composed forms have been designed to be absolutely precise in the combination of the two elements and to be more visually compact. The "ss" forms have less ascent and descent, making them more "printer friendly" and less prone to overlap with preceding and proceeding lines of text. For example: (with "ss") versus (composed normally).]

The higher numbers are as follows:

A) The Thousands Sign (τώς λιμα) can be rendered in two different ways: as a separate character (as it is always done in CS texts: *α), or attached (ligated) to the following letter (i.e., numeral) which it "modifies". The attached form is provided via Stylistic Set 1 (𝑔), while an alternate attached form is provided via Stylistic Set 2 (𝑔). (See the table below.)

As discussed *above*, most period manuscripts stretch the Titlo or Vzmet all the way across three or four characters in the formation of larger numerals, but there is no official rule in this matter.

The Middle Dot can be used with the numerals 1,000-9,999, but the original source should always be one's guide for usage. When an authentic model is lacking, we offer the following generic guideline: It makes more sense to use the Middle Dot only at the end of the character sequence (for example: *\vec{n}can.\vec{n}), since it it appears to be visually redundant as an initial numeral marker (\(\div*\vec{n}can.\vec{n}\)); the Thousands Sign and the Titlo or Vzmet already indicate that this is a numeral.

Thousands Sig	gn: U+0	0482 Cy	rillic Th	nousand	s Sign						*
sso1: (just app		-			_						*
sso2: (alternate ligated forms)										*	
Value:	1,000	2,000	3,000	4,000	5,000	6,000	alt.	7,000	alt.	8,000	9,000
a) With the T	<u>itlo:</u>										
default:	* ā ·	× E ·	×Г·	* T ·	× Є ·	× 5 ·	٠ <u>\$</u> ×	҂ ӡ ҃∙	∗ 3∙	×Ñ·	× .0 .
sso1:	Ā ·	<u>κ</u> .	, j.	Ā ·	Ē ·	5 .	¿ .	ڲٙ	,5 ·	ู้ ผี	₩.
sso2:	<u>,</u> ā.	ĸ K ·	, F·	Ā .	. €·	<u>,</u> 5.		۶	ج غ ٠	_х й·	٠ ٠
b) With the V	zmet:	•	•	•		·	•	•		•	
default:	* \(\bar{\alpha}\cdot\)	× R ·	×r.	* \'\ ·	* £ ·	× S ·	* S •	* \'\'	* 3 ·	×Й·	× .0 .
sso1:	Ā ·	K .	j .	Ä ·	Æ ·	5 .	.	" Ž·	3 ·	й .	,
sso2:	ă·	<u> </u>	; F·	Ä.	.€ Z	\ddot{z} .	'g.	ğ.	₹ 0 ·

B) The Ten Thousands Sign (тма, тьма), as well as all of the following symbols, are entered following the character that they modify, since they combine with (or attach to) the preceding character.

Stylistic Set 1 offers a slightly more compact or "tighter" version; these optimized forms are of benefit to publishers who find that the added enclosing symbols may ascend and descend too far beyond the default "line leading" of the paragraph.

Ten Thousan	en Thousands Sign: U+20DD Combining Enclosing Circle										0	
sso1:											0	
default:	(A)	B	(ľ)	(I)	E	(\$)	3	3	3	N	①	
sso1:	(A)	B	⑥	(1)	E	③	3	Z	3	Ø	(1)	

C) The Hundred Thousands Sign (легею́нь or несвыть) functions analogously to the previous character.

Hundred Th	ousand	s Sign:	U+0488	3 Comb	ining C	yrillic H	Hundred	Thousa	ands Sig	<u>gn</u>	:::	
sso1:												
default:	· a :	· B:	· ř :	Ä.	:e:	s	·s:	ż	3.	; и;	• •	
sso1:	·ā:	·Ř:	:ŗ :	·Ā:	∶ę :	. \$:	·\$·	;Ż :	:3:	∙;й;•	·ė:	

D) The Millions Sign (λεώλρτ) is similar to the others, but has an additional alternate form, accessed using Stylistic Set 2.

Millions Sig	Millions Sign: U+0489 Combining Cyrillic Millions Sign											
sso1:											1,1	
sso2:											5,5	
default:	֓֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	ŠŘ	, r,	ZĂ;	¿Ę;	25,	25,	֖֡֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	33,	źĄ,	200	
sso1:	iá;	ŢŖ,	ŢŢ	Á	¿Ġ;	15,	7.5.	Ž	' '\$	ŹŅ̈́,	7. 6 7	
sso2:	ŞŽ	ÿŖŝ	ÿĔŞ	\$ À \$	ÿ ĕ ÿ	ુંફુંડ્રે	ŞŜŚ	$\hat{\mathbf{z}}\hat{\mathbf{z}}\hat{\mathbf{z}}$	ું ઝું ડું	ĕŘÿ	Ÿ Ģ Ÿ	

E) The Ten Millions Sign (вранъ or воронъ) likewise has two alternate forms (Stylistic Sets 1 and 2).

Ten Millions	s Sign:	U+A67	0 Comb	oining C	yrillic [Ten Mil	lions Si	g <u>n</u>			+ ⁺ + + + + ₊ +	
sso1:											+ ⁺⁺ + + ₊₊ +	
sso2:											*** * * * *	
default:	+ A +	+ * + + + + + + + + + + + + + + + + + + +	+	+ , +++	+ 6 +	+ + + + + + + +	+ \$ + + + + + + + + + + + + + + + + + + +	+ * +*+	+ 3 +	+	+++++	
sso1:	÷***	+ ‡‡ +	‡ ‡‡	+ ‡ ‡ ‡	÷ ‡‡÷	÷\$÷	‡ ‡ ‡	‡ ‡ ‡	‡‡‡	+ ‡ ¼ ‡	÷††+	
sso2:	* _ *	××××	* Ľ *	* Ä *	× č ×	׊× ׊×	×** ×**	׎× ×××	* 3 *	*XXX	××Č×	

F) The Hundred Millions Sign (коло́да) also has two alternate forms (Stylistic Sets 1 and 2).

Hundred M	illions S	Sign: U-	+A671 (Combin	ing Cyr	illic Hu	ndred N	Millions	Sign		0	
sso1:											\bigcirc	
sso2:											1	
default:	(A)	B	T		$\mathbf{\mathfrak{E}}$	3	3	3	3	(N)	(1)	
sso1:	A	\bigcirc	(L)	①	\odot	③	\odot	Z	3	W	①	
sso2:	Ā	E	T	<u>A</u>	E	3	$\overline{\mathbf{S}}$	Z	3	И	⊕	

G) The Thousand Millions Sign (TMÀ TÉME, TEME) also has two alternate forms (Stylistic Sets 1 and 2). While these numbers can be found in a few grammar books, there is disagreement regarding their usage. (It appears that the only original textual evidence of its use is in a list of numbers, where one thousand million is oddly presented as i.)

Thousand N	Millions	Sign: U	J+A672	Combi	ning Cy	rillic Tl	housand	Million	ns Sign		-+- 	- PI -
sso1:											<u>=</u> _=	<u>≣</u> PĪ≣
sso2:											=	≡ P <u>†</u> ≡
default:	- _a	- <u>*</u> -	- r -	- T -	- e -	- \$ -	- 8 -	- z -	- 3 -	- <mark>н</mark> -	- <u>'</u>	
sso1:	<u>=_</u>	<u>=_</u> <u>#_</u> =	<u> </u>	<u></u>	<u>=</u> <u><u></u><u></u><u></u><u></u><u></u>=</u>	<u>-\$-</u>	<u>=</u> <u>\$</u> =	<u>=_</u> <u>*</u> _=	<u>=</u> _ 3 _=	ĒŅĒ	<u>=</u> _ _	
sso2:	≡ ⊼ ≡	≡Ř≡	≡ <mark>↑</mark> ≡	≡ ‡	≡ Ė ≡	≡ \$=	≡	≡ Ž ≡	≡ 3=	≡ Ņ ≡	≣ ,	

2. Additional lookups for Old Church Slavonic used in the Shafarik font:

2.1. A precomposed form of U+0456 Cyrillic Byelorussian-Ukrainian I with titlo (this will form automatically as the characters are typeset in sequence):

2.2. Variant forms of some characters are available via Stylistic Alternates (SALT) feature (in LibreOffice, change the font name to "Shafarik:salt")

 Nи
 >
 Нн

 Чч
 Чч

 Ыъі
 >
 Бы

 ІЄю
 >
 ІЄю

 Да
 >
 Да

2.3. Additional ligatures are formed by inserting the Zero Width Joiner (U+200D):6

N', N' $N + ZWJ + \Gamma$; $N + ZWJ + \Gamma$ айль A + ZWJ + V райнса A + ZWJ + V аллиції A + ZWJ + V совори

2.4. Double-titla (two idiomatic usages for specific words, and one generic usage):

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⁶⁾ When typesetting texts in LibreOffice, it seems that adding the Zero Width Joiner from the character picker does not work (a bug in LibreOffice!). One can enter the character by codepoint by typing Ctrl+Shift+U, then 200D, Enter, or from the Russian Extended Keyboard layout by typing Alt+Shift 1. See the keyboard documentation for more information.

3. Additional OCS Symbols

In addition to the standard punctuation symbols used in later periods of Church Slavonic, OCS also makes use of several additional symbols, some of which are stylistic variants (which may have been encoded in Unicode or may be accessible in the font as stylistic alternates), and some of which are ornamental punctuation forms. In many instances, these symbols are used merely as text or page decoration, but they may also be used in place of standard punctuation. These symbols are used in both Cyrillic and Glagolitic scripts.

		Punctuation Symbols	
U+00B7		Middle Dot	The Elevated Period or Middle Dot (·), which is derived from Greek use, signifies a type of pause or stop or line separation in stichometry. It is also used as a numeral marker (see above). It is not recommended to use the U+2027 Hyphenation Point · or U+2219 Bullet Operator ·, as these have different properties and functions in Unicode.
U+2022	•	Bullet	Manuscripts often make use of a heavier version of the elevated period (the Bullet •) when a full stop or period is intended.
U+2E34	,	Raised Comma	
U+2E49	3	Double Stacked Comma	This can be combined with the Raised Comma:
U+205A	:	Two Dot Punctuation	
U+205D	:	Tricolon	
U+205E	i	Vertical Four Dots	
U+2056	:	Three Dot Punctuation	
U+10FB	:	Georgian Paragraph Separator	Used in Cyrillic and Glagolitic, not just Georgian.
U+2E2A	••	Two Dots Over One Dot Punctuation	
U+2E2B	٠٠.	One Dot Over Two Dots Punctuation	
U+2058	÷	Four Dot Punctuation	
U+205B	÷	Four Dot Mark	
U+2E2C	::	Squared Four Dot Punctuation	
U+2059	×	Five Dot Punctuation	
U+2E2D	÷	Five Dot Mark	
		Introductory Symbols	
U+00A7	\$	Section Sign	
U+00B6	9	Pilcrow Sign	
U+F0135	(E	Decorative Section Sign	Only available in the PUA
U+F0136	0	Decorative Section Sign	Only available in the PUA

U+261E	F	White Right Pointing Finger	
		Ending Symbols	
U+007E	~	Tilde	The Ending Symbols are typically paired with a Colon or Three Dot Punctuation for a decorative effect: :~ :~
U+2053	~	Swung Dash	~ ∻
U+223B	÷	Homothetic	;∻ ÷÷
U+223C	7	Tilde Operator	<i>:</i> ∼ <i>⊹</i> ∼
U+223D	<u>~</u>	Reversed Tilde	:- ·-
U+2241	~	Not Tilde	;~ :~
U+2E43	_	Dash With Left Upturn	May be used alone or as : ← : ←
	<u>_</u>	Decorative End Mark (salt)	Available as <i>salt</i> of U+2E43 or via PUA at U+F0111 May be used alone or as : :
		Crosses	
U+203B	*	Reference Mark	
U+205C	#	Dotted Cross	
U+2626	‡	Orthodox Cross	
U+271A	+	Heavy Greek Cross	
U+2720	Ħ	Maltese Cross	
U+F0134	*	Decorative Cross	Only available in the PUA
U+EDFF	±	Decorative Cross	Only available in the PUA
		Other Symbols	
U+2E46	X	Inverted Low Kavyka With Kavyka Above	
U+2E48	٠	Low Kavyka With Dot	

PART 2: GLAGOLITIC

1. Introduction

There are several resources available on the Internet to help the font user become familiarized with the Glagolitic script. While it is not the purpose of this documentation to list these resources, we recommend the following documents, which provide a good start:

Glagolitic Script: https://en.wikipedia.org/wiki/Glagolitic script

Glagolitic (Unicode Block): https://en.wikipedia.org/wiki/Glagolitic (Unicode block)

List of Glagolitic Manuscripts: https://en.wikipedia.org/wiki/List of Glagolitic manuscripts

Relationship of Cyrillic and Glagolitic Scripts:

https://en.wikipedia.org/wiki/Relationship of Cyrillic and Glagolitic scripts

See also:

Omniglot: Glagolitic alphabet and pronunciation: https://www.omniglot.com/writing/glagolitic.htm

Test for Unicode support in Web browsers: http://www.alanwood.net/unicode/glagolitic.html

http://www.croatianhistory.net/etf/et03.html

https://sites.google.com/site/seesscm/glagolitic-script

Глаголица - Многоочитая азбука - http://www.rbardalzo.narod.ru/4/glag.html

https://www.garshin.ru/linguistics/scripts/alphabet/vocalic/hellenic-abc/cyrillic/glagolic.html

2. Glagolitic Script Styles

- a) The standard Glagolitic character set is the **Round Glagolitic** script (*Okrugla glagoljica*), which is an idealized reproduction of a style of handwriting used in Glagolitic manuscripts from the late 10th to early 12th centuries, mostly from Bulgaria. This is encoded at U+2C00 through U+2C5F.
- b) A style used in Croatian manuscripts starting in the 13th century and known as the **Angular (or Square) Glagolitic** script (*Uglata glagoljica*) has been encoded in the Private Use Area at U+F0200 through U+F025F. These glyphs may be accessed by turning on the font feature *Stylistic Set 3 (ss03)*.
- c) The version of the Angular Glagolitic Script used in printed editions in Kosinj and Venice in the 15th and 16th centuries is known as "**Angular Glagolitic Missal Script**" or "**Missal Angular Glagolitic Script**". These glyphs have been encoded in the Private Use Area at U+F0270 through U+F02CF, and may be accessed by turning on the font feature *Stylistic Set 4 (ss04)*.

For a comparison of the Round, Angular and Missal Angular scripts, see Table A below.

d) In addition, there is a "Triangular Script" (*Trokutasta glagoljica*) used for stone inscriptions and other decorative uses, based on a geometric combination of lines going through a circle to form triangular shaped letters. (For a methodical presentation, see:

https://repozitorij.ffos.hr/islandora/object/ffos%3A2944/datastream/PDF/view). This form of Glagolitic is not supported in the Shafarik font.

e) In later periods of the use of Glagolitic, two types of miniscule evolved (*Knjiška kurzivna glagoljica*, *Kancelarijska kurzivna glagoljica*), both of which include the use of ligatures. See https://glagoljica.stin.hr/ for a presentation of the lettering styles of Glagolitic: *Okrugla glagoljica*,

Uglata glagoljica, Trokutasta glagoljica, Knjiška kurzivna glagoljica, and Kancelarijska kurzivna glagoljica. See also:

www.zigh.at/fileadmin/user upload/media/Platforma za mlade/FBA-novo 2 .pdf

f) A true Cursive lettering style likewise evolved, but documentation is difficult to find. (For an example, see: http://www.croatianhistory.net/gif/razvod.jpg). Skoropis and cursive forms are likewise not provided in the Shafarik font.

3. Standard set of characters

Glagolitic Range: 2C00–2C5F (Capital Letters and Small Letters, Round Glagolitic Script)

Glagolitic (Capital Letters		Glagolitic S	Small Letters	
U+2C00	AZU	ሑ	U+2C30	AZU	4
U+2C01	BUKY	巴	U+2C31	BUKY	е
U+2C02	VEDE		U+2C32	VEDE	P
U+2C03	GLAGOLI	90	U+2C33	GLAGOLI	90
U+2C04	DOBRO		U+2C34	DOBRO	ക
U+2C05	YESTU	Э	U+2C35	YESTU	Э
U+2C06	ZHIVETE	86	U+2C36	ZHIVETE	&
U+2C07	DZELO	&	U+2C37	DZELO	&
U+2C08	ZEMLJA	ذ	U+2C38	ZEMLJA	0 °
U+2C09	IZHE	ሞ	U+2C39	IZHE	ሞ
U+2C0A	INITIAL IZHE	**	U+2C3A	INITIAL IZHE	%
U+2C0B	I	8	U+2C3B	I	8
U+2C0C	DJERVI	፠	U+2C3C	DJERVI	፠
U+2C0D	KAKO	þ	U+2C3D	KAKO	>
U+2C0E	LJUDIJE	&	U+2C3E	LJUDIJE	&
U+2C0F	MYSLITE	\mathfrak{M}	U+2C3F	MYSLITE	888
U+2C10	NASHI	ታ	U+2C40	NASHI	. ₽
U+2C11	ONU	9	U+2C41	ONU	9
U+2C12	POKOJI	Ъ	U+2C42	POKOJI	ъ
U+2C13	RITSI	Ь	U+2C43	RITSI	ь
U+2C14	SLOVO	8	U+2C44	SLOVO	8
U+2C15	TVRIDO	σο	U+2C45	TVRIDO	σο
U+2C16	UKU	33	U+2C46	UKU	39
U+2C17	FRITU	d ₽v	U+2C47	FRITU	ъ
U+2C18	HERU	b	U+2C48	HERU	Ь
U+2C19	OTU	0	U+2C49	OTU	0
U+2C1A	PE	П	U+2C4A	PE	ФI
U+2C1B	SHTA	ሀ	U+2C4B	SHTA	₩
U+2C1C	TSI	V	U+2C4C	TSI	v
U+2C1D	CHRIVI	#	U+2C4D	CHRIVI	4
U+2C1E	SHA	Ш	U+2C4E	SHA	ш

YERU	a	U+2C4F	YERU	- a
YERI	- ə	U+2C50	YERI	ə
YATI	A	U+2C51	YATI	A
SPIDERY HA	坏	U+2C52	SPIDERY HA	坏
YU	ም	U+2C53	YU	ľ
SMALL YUS	€	U+2C54	SMALL YUS	€
SMALL YUS WITH TAIL	æ	U+2C55	SMALL YUS WITH TAIL	Æ
YO	⊗	U+2C56	YO	8
IOTATED SMALL YUS	Э€	U+2C57	IOTATED SMALL YUS	3€
BIG YUS	∌€	U+2C58	BIG YUS	≆ €
IOTATED BIG YUS	9€	U+2C59	IOTATED BIG YUS	9€
FITA	∙ 0 ∙	U+2C5A	FITA	↔
IZHITSA	8.	U+2C5B	IZHITSA	8 .
SHTAPIC	1	U+2C5C	SHTAPIC	1
TROKUTASTI A	Ħ	U+2C5D	TROKUTASTI A	Ħ
LATINATE MYSLITE	M	U+2C5E	LATINATE MYSLITE	M
CAUDATE CHRIVI	Å	U+2C5F	CAUDATE CHRIVI	Å
	YERI YATI SPIDERY HA YU SMALL YUS SMALL YUS WITH TAIL YO IOTATED SMALL YUS BIG YUS IOTATED BIG YUS FITA IZHITSA SHTAPIC TROKUTASTI A LATINATE MYSLITE	YERI YATI A YATI SPIDERY HA YU P SMALL YUS SMALL YUS WITH TAIL YO IOTATED SMALL YUS BIG YUS FITA IZHITSA SHTAPIC TROKUTASTI A LATINATE MYSLITE	YERI → U+2C50 YATI ▲ U+2C51 SPIDERY HA ★ U+2C52 YU ✔ U+2C53 SMALL YUS € U+2C54 SMALL YUS WITH TAIL • U+2C55 YO ♦ U+2C55 IOTATED SMALL YUS → U+2C57 BIG YUS → U+2C58 IOTATED BIG YUS → U+2C59 FITA → U+2C5A IZHITSA ♣ U+2C5B SHTAPIC J U+2C5C TROKUTASTI A ▶ U+2C5D LATINATE MYSLITE M U+2C5E	YERI → U+2C50 YERI YATI △ U+2C51 YATI SPIDERY HA ♣ U+2C52 SPIDERY HA YU ✔ U+2C53 YU SMALL YUS ♠ U+2C54 SMALL YUS SMALL YUS WITH TAIL ♠ U+2C55 SMALL YUS WITH TAIL YO ♠ U+2C56 YO IOTATED SMALL YUS → U+2C57 IOTATED SMALL YUS BIG YUS → U+2C58 BIG YUS IOTATED BIG YUS → U+2C59 IOTATED BIG YUS FITA → U+2C5A FITA IZHITSA ♣ U+2C5B IZHITSA SHTAPIC J U+2C5C SHTAPIC TROKUTASTI A H U+2C5D TROKUTASTI A LATINATE MYSLITE M U+2C5E LATINATE MYSLITE

4. Remarks on Problematic Characters in the Unicode Glagolitic Block

- 1) The letter "Fert" in the later *Angular* Glagolitic is patterned directly after the Cyrillic form and has a vertical middle line [Cyrillic: Φ Φ , Glagolitic: Φ Φ]; this is the form accessible via ss03 and ss04. On the other hand, the older *Round* Glagolitic script (the default character set in the Shafarik font) usually did not exhibit a significant difference between the shape of the letter "Fert" and "Fita"; in general usage, the shape of "Fert" was a more squared-off version of "Fita", and the center line was horizontal for BOTH letters (Fert: Φ Φ); this is the form provided by default. However, some Glagolitic documents (such as the Assemani Gospel) used the Greek-derived sign Phi (Φ Φ) instead of the " Φ - Φ " form; this form is available via the Stylistic Alternates (salt) feature or from the PUA at U+EC66/U+EC77.
- 2) The *Shtapic* (1 1) is an alternate form of the "yers" (the semi-vowels or "poluglasny"), and can signify either a hard or soft sign. It can be transliterated into OCS Cyrillic as U+A64E Cyrillic Capital Letter Neutral Yer, U+A64F Cyrillic Small Letter Neutral Yer (1 1), or into modern Cyrillic or Latin text as U+02B9 Modifier Letter Prime, U+02BA Modifier Letter Double Prime to indicate an indefinite mutation of the preceding consonant. It is essentially a Glagolitic *Yerok/Payerok*.
- 3) The *Trokutasti A* (\bowtie) is an unfortunate addition of an alternate letter form (a Stylistic Alternative) which is found in the *Trokutasti* (Triangular) style of lettering.
- 4) The Latinate Myslite (M M) is another unfortunate addition of an alternate letter form. Observing that the regular character form of the Myslite (Round: 黎敏, Angular: 珊珊, Alt-1: ₩, Alt-2: 珊) is overly complex, it seems likely that scribes grew weary of trying to execute it with feather

⁷⁾ The characters U+0027 Apostrophe, U+0022 Quotation Mark should not be used to transliterate the Soft Sign and Hard Sign ("yers"), because these characters are treated as a word boundary, rather than as a part of a word. See Sections 6.2, subsection "Apostrophes", and 7.4, subsection "Cyrillic" – "Palatalization", of the Unicode Standard for more information.

pens, choosing instead to substitute the simpler form of the "M" from the Cyrillic or Latin alphabet. Though it is merely a Stylistic Alternative of the base character, it has been encoded in Unicode as a standalone character.

5) The *Caudate Chrivi* ("Tailed Cherv", **y** y) has been recently accepted for inclusion in Unicode. (See L2/19-288R). When used with U+0303 Combining Tilde, it indicates an abbreviation for "et cetera". It appears in a few manuscripts and early printed books.

Three other characters are likewise controversial or worthy of comment, and the student of Glagolitic can benefit from reading the following documents:

- 6) Unicode 2C1A Glagolitic "Pe": Fact or Fiction? by Sebastian Kempgen
- 7) Why OT? Why nOT? A Note on the Development of a Cyrillic Letter by Sebastian Kempgen. (See also Section 6 below: Glagolitic Superscript Characters.)
 - 8) *The Glagolitic 'spidery kh'* < \(\mathbf{x} > \), its origin and relatives by Sebastian Kempgen
- 9) In the vowel system of Old Church Slavonic, the "yers" (\mathbf{r} , \mathbf{b} and \mathbf{e}) recorded ultra-short reduced vowels *[\mathbf{u}] and *[\mathbf{i}]. The degree of their reduction depended on their position within a word. Around the 11th century, in many Slavic dialects yers in the "weak position" were lost, which resulted in the orthographic confusion of \mathbf{r} and \mathbf{b} in manuscripts or the omission of "weak yers" entirely. At the same time, perhaps due to the loss of the "weak yers", the yers in the strong position became fully vocalized, resulting in the confusion of \mathbf{r} , \mathbf{b} and \mathbf{o} , \mathbf{e} in manuscripts. Since the orthographic usage of a scribe tends to reflect local dialectic peculiarities, information on the usage of yers is helpful in localizing and dating manuscripts and / or texts. Editors should strive to faithfully reproduce the usage of the yers in editions. The characters U+A64E, U+A64F Cyrillic Letter Neutral Yer \mathbf{b} was encoded in Unicode to transcribe yers in instances where it is impossible to tell the difference between \mathbf{b} and \mathbf{b} , but this is mostly an issue in later Russian documents. (See also the *Shtapic* above). The following resources will provide a sufficient introduction to the Old Slavic yers:

Yer: https://en.wikipedia.org/wiki/Yer

Proto-Slavic: https://en.wikipedia.org/wiki/Proto-Slavic

History of Proto-Slavic: https://en.wikipedia.org/wiki/History_of_Proto-Slavic

Havlík's law: https://en.wikipedia.org/wiki/Havl%C3%ADk%27s law

History of the Russian language: https://en.wikipedia.org/wiki/History_of_the_Russian_language

History of the Slavic languages: https://www.wikiwand.com/en/History of the Slavic languages

5. Glagolitic Casing

Glagolitic used in manuscripts was generally not a bicameral script; in other words, it did not have a modern upper case. The upper case forms included within the font are intended to be used for decorative drop-caps and for titling.

Glagolitic scripts, unlike modern Cyrillic scripts, do not traditionally align the bottom of their upper and lower case characters on top of the "base line", but instead they hang from a shared "top line".

⁸⁾ While the characters U+0483 Combining Cyrillic Titlo and U+A66F Combining Cyrillic Vzmet are technically not intended to be used for Glagolitic, since their script property is set to *Cyrillic*, there is currently no other available choice.

However, since this font is intended for academic use and must have a harmonious pairing of both Cyrillic and Glagolitic scripts, we have unfortunately had to compromise on this principle.

6. Glagolitic Superscript Characters

Combining Glagolitic letters have been encoded in Unicode in the Glagolitic Supplement Range: U+1E000–U+1E02F. These are used in the default Round Script, but seem not to be used much in the Angular Script tradition. Even within the Round Script tradition, it seems that superscript characters were used far less frequently than with Cyrillic texts.

Here, each of the combining superscript letters are placed above their corresponding base character:

Note that five of the characters above are [bracketed] because they are not attested; these have not been encoded in Unicode and should not be used. They have been encoded in the font for the sake of completeness. They may not be correctly supported by software since they are not valid codepoints.

One particular pairing that is frequently seen is the preposition and prefix "ot" (which can be formed with either the "omicron" or "omega" forms of the letter "o"). Unlike the Cyrillic Unicode block, which includes the definitive digraph $\ddot{\mathbf{o}}\ddot{\mathbf{o}}$, the same combination in Glagolitic scripts must be composed of the "o" plus a "superscript t", since a separate character for "ot" has not been encoded. The following table demonstrates the variant valid representations of this pairing. Note that the "superscript t" is the only superscript character which has an alternate Angular form:

Round Script (default):	ä	$\ddot{9}$	or with omega:	Ö	Ö	[ံ]
Angular Script (sso3):	ĬÏ	Ë	or with omega:	亞	뗲	[៉ី]
Angular Missal Script (sso4):	ĬŔ	F	or with omega:	$\mathbf{\ddot{Q}}^{9}$	뗲	[៉ី]

The precomposed forms of the Ot have been encoded in the Private Use Are at the codepoints U+ECE0 to U+ECE9 for use in settings where OpenType is unavailable or unsupported.

For more information, see the Proposal to Encode Combining Glagolitic Letters in Unicode: http://std.dkuug.dk/JTC1/SC2/WG2/docs/n4608.pdf. The combining Glagolitic characters are listed:

Combining	Glagolitic Characters				
U+1E000	AZŪ	៎	U+1E014	SLOVO	ိ
U+1E001	BUKY	្ត	U+1E015	TVRIDO	
U+1E002	VEDE	ំ	U+1E016	UKU	.;; :;;
U+1E003	GLAGOLI	% :	U+1E017	FRITU	°
U+1E004	DOBRO	្	U+1E018	HERU	ိ်
U+1E005	YESTU	;;	U+1E01B	SHTA	ឺ
U+1E006	ZHIVETE	∷: Э€	U+1E01C	TSI	ំ
U+1E008	ZEMLJA	ో ో	U+1E01D	CHRIVI	* ∵
U+1E009	IZHE	ு ்	U+1E01E	SHA	்
U+1E00A	INITIAL IZHE	∵ ~	U+1E01F	YERU	ૺૼ
U+1E00B	I	ీ	U+1E020	YERI	ै

⁹⁾ Note that the upper case form of the Angular Missal Script has an anomalous Round Script form.

U+1E00C	DJERVI o''	U+1E021	YATI	்
U+1E00D	KAKO °	U+1E023	YU	్లో
U+1E00E	LJUDIJE	U+1E024	SMALL YUS	ું€
U+1E00F	MYSLITE ::**	U+1E026	YO	.∵
U+1E010	NASHI of	U+1E027	IOTATED SMALL YUS	∋ €
U+1E011	ONU °	U+1E028	BIG YUS	့
U+1E012	POKOJI of	U+1E029	IOTATED BIG YUS	₽ € ∷
U+1E013	RITSI ీ	U+1E02A	FITA	្

7. Glagolitic Numerals and Word Abbreviations (Letters with Titla)

a. Numerals

Glagolitic numerals are formed in several variant ways, without any "standard" or "official" method of presentation. Users should represent numerals as they are given in the original texts. In the absence of an original text, we recommend following the formation of Cyrillic numerals. See the section on the presentation of Cyrillic numerals, above, for examples.

Note: It seems that Glagolitic texts should use U+0303 Combining Tilde to encode the overline character above numerals. This is provided in the font as a wavy line; if a "titlo" or "vzmet" form is desired, the characters U+0483 Combining Cyrillic Titlo and U+A66F Combining Cyrillic Vzmet can be used, even though their script property is set to *Cyrillic*, rather than *Glagolitic* or *Inherited*. A separate Glagolitic Titlo or Vzmet has not been encoded in Unicode. For example:

		normal	ss03	ss04
U+0303	Combining Tilde	ب	ų	щ
U+0483	Combining Cyrillic Titlo	4	ų	ų
U+A66F	Combining Cyrillic Vzmet	4	Ψ.	Ψ

Note: The usage of Cyrillic Titlo or Vzmet with Glagolitic characters is not supported in LibreOffice.

b. Word Abbreviations

A number of precomposed letters with U+0303 Combining Tilde are encoded in the PUA in the block U+ECA0 through U+ECFF. These precomposed forms have been included because they require a wider or narrower version of the tilde symbol than the default width. All of these are Angular Glagolitic forms, and are formed automatically when Stylistic Set 3 (or Stylistic Set 4) is turned on. They may be accessed from the PUA if OpenType features are unsupported.

Description	Form	PUA Codepoint
Glagolitic Vede (U+2C32)	ũ	U+ECA3
Glagolitic Glagoli (U+2C33)	<u>5</u>	U+ECA4
Glagolitic Dobro (U+2C34)	<u>m</u>	U+ECA5
Glagolitic Zhivete (U+2C36)	ñ	U+ECA6

Description	Form	PUA Codepoint
Glaolitic Zemlja (U+2C38)	₽ã	U+ECA7
Glagolitic Izhe (U+2C39)	⊕	U+ECA8
Glagolitic Initial Izhe (U+2C3A)		U+ECA9
Glagolitic Djervi (U+2C3C)	ĨP	U+ECAA
Alternate form of U+2C3C (salt)	₩	U+ECAB
Glagolitic Ljudije (U+2C3E)	щ	U+ECAC
Glagolitic Myslite (U+2C3F)	₩	U+ECAD
Glagolitic Tvrido (U+2C45)	m	U+ECAE
Glagolitic Heru (U+2C48) (ss04)	ъ̃	U+ECAF
Glagolitic Otu (U+2C49) (ss04)	쥰	U+ECBo
Glagolitic Yu (U+2C53)	р	U+ECB1
Glagolitic Shtapic (U+2C5C)	Ĩ	U+ECB2

A number of pre-composed ligatures with the tilde are also offered. These are formed automatically when Stylistic Set 5 is turned on:

Description	Form	PUA Codepoint
Buki Ritsi		U+ECCo
Vedi Tvrido	om	U+ECC1
Vedi Tvrido Ritsi	йб	U+ECC2
Mysliti Ljudije	₩	U+ECC3
Mysliti Zhivete	₩	U+ECC4
Mysliti Izhe Ljudije	₩	U+ECC5
Mysliti Slovo	₩	U+ECC6
Mysliti Chrivi	₩	U+ECC7
Tvrido Vedi	ത്ത	U+ECC8
Tvrido Vedi Ritsi	ф	U+ECC9
Glagoli Ritsi	я́	U+ECCA

c) Additional Variant Shapes of Overlines for Word Abbreviations

The font includes several variant forms of U+0483 Combining Titlo, U+A66F Combining Vzmet, U+0487 Combining Pokrytie and U+0303 Combining Tilde, which may be used for Cyrillic or Glagolitic, to represent various supralineation characters that occur in manuscripts. These are invoked by turning on the relevant Stylistic Alternative (*salt*). To access the *salt* forms in LibreOffice, change

the font name to "Shafarik:salt=x", where 'x' is the number. The first *salt* form may be accessed without a numerical value, as both "Shafarik:salt" and "Shafarik:salt=1". The PUA codepoint is also given for reference.

Unicode	Stylistic Alternate		PUA codepoint	Shape	Cyrillic example	Glagolitic example
U+0303		Combining Tilde		េ	ř	9 0
	salt=1	Alternate Combining Tilde (flipped variant)	U+ECA1	ः	ř	8
	salt=2	Alternate Combining Tilde (narrow flipped variant)	U+ECA0	់	ř	9 0
	salt=3	Alternate Combining Tilde (wide flipped variant)	U+ECA2	े	ŗ	%
	salt=4	Alternate Combining Tilde (narrow variant)	U+E010	र े	ř	9 .
	salt=5	Alternate Combining Tilde (wide variant)	U+E011	l	~ r	90
	salt=6	Combining Galgolitic Tilde (plain variant)	U+E012	ें	r	9 0
	salt=7	Combining Galgolitic Tilde (ornamental variant)	U+E013	ें	ŕ	9.
	salt=8	Combining Galgolitic Tilde (another ornamental variant)	U+E014	#	r r	9 .
U+0304		Combining Macron		্	r	<i>9</i> ₀
U+0305		Combining Overline		$\bar{\circ}$	r	9 ₀
U+0360		Combining Double Titlo		্ত	TT	9.9.
	salt=1	Alternate Combining Double Tilde	U+E015	ैंं	Τ̈́Γ	22
U+0361		Combining Double Inverted Breve		ंं	TT	9,9,
U+0483		Combining Cyrillic Titlo		េះ	ŕ	9,
	salt=1	Alternate Combining Cyrillic Titlo (wide variant 1)	U+E016	៊	ŗ	8
	salt=2	Alternate Combining Cyrillic Titlo (wide variant 2)	U+E017	্	r	9.
	salt=3	Alternate Combining Cyrillic Titlo (wide variant 2 reversed)	U+E018	៊	r	9.

	salt=4	Alternate Combining Cyrillic Titlo (wide decorative reversed variant)	U+E019	ं	′/, Г	9.
	salt=5	Alternate Combining Cyrillic Titlo (flat decorative variant 1)	U+E01A	ं	ř	9.
	salt=6	Alternate Combining Cyrillic Titlo (flat decorative variant 2)	U+E01B	ं	ř	9,0
	salt=7	Alternate Combining Cyrillic Titlo (flat decorative variant 3)	U+E01C	े	r	9.
U+0487		Combining Cyrillic Pokrytie		ି	Î	90
	salt=1	Alternate Combining Cyrillic Pokrytie (rounded variant)	U+E01D		r	8
	salt=2	Alternate Combining Cyrillic Pokrytie (angular variant)	U+E01E	े	r	9,
U+A66F		Combining Cyrillic Vzmet		ं	ř	9,
	salt=1	Alternate Combining Cyrillic Vzmet (wide variant)	U+E01F	៏	F	%
U+FE26		Combining Conjoining Macron		ः	<u></u>	90
U+FE27		Combining Cyrillic Titlo Left Half		্	T	9,0
U+FE28		Combining Cyrillic Titlo Right Half		ं	r	9.

Known Limitations:

- 1) Typical word processing software (such as LibreOffice) will not allow you to turn on the *salt* feature for only a diacritical mark. It is possible to achieve correct presentation in LaTeX with the *churchslavonic* package. In other software you will need to turn on the *salt* feature for both the mark and the base glyph that it modifies. This may lead to undesirable results in instances where the base character also has an alternate form accessible via *salt*. As a workaround, you can enter the desired alternate supralineation character directly by codepoint from the PUA.
- 2) LibreOffice apparently does not allow for the correct positioning of marks encoded in the PUA over Cyrillic characters. One should proceed with caution or find a suitable work-around.
- 3) LibreOffice also does not allow the use of the Cyrillic combining marks: U+0483 Combining Cyrillic Titlo, U+0487 Combining Cyrillic Pokrytie, and U+A66F Combining Cyrillic Vzmet with Glagolitic characters.
- 4) As mentioned previously: The implementation of Titlo Halves in LibreOffice seems to be buggy.

8. Alternate Forms of Characters

In the PUA, block U+EC60 through U+EC9F is dedicated to Stylistic Alternatives (*salt*) for Round and Angular Glagolitic. These include significant character shape variants that are found in both manuscripts and printed editions. The PUA codepoints are also indicated for reference.

Codepoint:	Main Form	Variant Form (Description)	PUA Codepoint
ROUND SCRIPT			
U+2Co3	90	र (Alt Round Capital Glagoli)	U+EC60
U+2C33	90	№ (Alt Round Small Glagoli)	U+EC61
U+2C04		ಷಿ (Alt Round Capital Dobro)	U+EC62
U+2C34	&	a (Alt Round Small Dobro)	U+EC63
U+2CoF	쨇	₩ (Alt Round Capital Myslete)	U+EC64
U+2C3F	ळ		U+EC65
U+2C17	ф	Φ (Alt Round Capital Friti)	U+EC66
U+2C47	ollo	ֆ (Alt Round Small Friti)	U+EC67
U+2C19	0	(Alt Round Capital Otu)	U+EC68
U+2C49	0	Φ (Alt Round Small Otu)	U+EC69
U+2C20	ન્ક	ម (Alt Round Capital Soft Sign)	U+EC6A
U+2C50	- 9	ə (Alt Round Small Soft Sign)	U+EC6B
U+2C22	坏	ծ (Alt Round Capital Spidery Ha)	U+EC6C
U+2C52	坏	ծ (Alt Round Small Spidery Ha)	U+EC6D
U+2C24	€	& (Alt Round Capital Small Yus)	U+EC6E
U+2C54	€	& (Alt Round Small Yus)	U+EC6F
ANGULAR SCRIPT			SS03, SS04
U+2C30	ф	salt=7: n Alt Angular Small Azu (tall variant) [salt=7 is used here because salt=26 are used for the Baromić ligatures; see Table B.]	U+EC76
U+2C02	P	TP Alt Angular Capital Vedi (connected variant)	U+EC77
U+2C05	Э	3 Alt Angular Capital Yest (uncrossed variant)	U+EC78
U+2C35	э	a Alt Angular Small Yest (uncrossed variant)	U+EC79
U+2C08	ذ	ъ Alt Angular Capital Dzelo	U+EC7A
U+2C38	ذ	ዜ Alt Angular Small Dzelo	U+EC7B
U+2CoC	જ	₩ Alt Angular Capital Gerv	U+EC7C
U+2C3C	%	н Alt Angular Small Gerv	U+EC7D
U+2CoF	7 77	Salt=2 W Alt-1 Angular Capital Myslete	U+EC7E
U+2CoF	쨇	Salt=3 器 Alt-2 Angular Capital Myslete	U+EC7F

U+2C11	Э	ዝ Alt Angular Capital Onu	U+EC80
U+2C16	æ	Ⅺ Alt Angular Capital Ouk	U+EC81
U+2C46	æ	я Alt Angular Small Ouk	U+EC82
U+2C1D	4	4 Alt Angular Large Chrivi	U+EC8E
U+2C4D	₩	4 Alt Angular Small Chrivi	U+EC8F
U+2C1F	අ	Salt=1 ₱ Alt-1 Angular Capital Hard Sign	U+EC83
U+2C1F	අ	Salt=2 all Alt-2 Angular Capital Hard Sign	U+EC85
U+2C1F	ಕಿ	Salt=3 A Alt-3 Angular Capital Hard Sign	U+EC87
U+2C4F	අ	Salt=1 - Alt-1 Angular Small Hard Sign	U+EC84
U+2C4F	අ	Salt=2 A Alt-2 Angular Small Hard Sign	U+EC86
U+2C4F	9	Salt=3 д Alt-3 Angular Small Hard Sign	U+EC88
U+2C20	ન્	Salt=2 'll Alt Angular Large Soft Sign	U+EC90
U+2C50	ə	Salt=2 11 Alt Angular Small Soft Sign	U+EC91
U+2C22	坏	Salt=2 ħ Alt Angular Capital Spidery Kha	U+EC89
U+2C52	坏	Salt=2 & Alt Angular Small Spidery Kha	U+EC8A
U+2C2C	1	1 Alt Angular Capital Shtapic	U+EC8B
U+2C5C	1	1 Alt Angular Small Shtapic U+EC8C	
U+2C2E	M	M Alt Angular Capital Latinate Myslete	U+EC8D

9. Truncated Letter Forms

Truncated versions of various letters, referred to as "Baromić broken ligatures", are a feature of the Angular manuscript tradition. These letter forms are included in the PUA at block U+F02E0 through U+F02F4 (*see Table B below*). Essentially, these truncated characters stood by themselves in the Angular Script manuscript tradition, but with the adaptation of Angular Glagolitic for use in early printed editions, type designers chose to close the slight gaps next to these truncated forms, resulting in a fascinating and diverse collection of ligatures.

10. Angular Glagolitic Ligatures

Angular Glagolitic Ligatures, used in both manuscript and printed traditions, and widely documented in both technical literature and existing fonts, are included in the block that currently spans from U+F0400 to U+F0490 (although we are free to add more glyphs up to U+F05FF if more space is needed). As it stands, the Glagolitic ligatures are alphabetized according to the letter of the alphabet, with pairs added in proper sorting order (*see Table C below*); six blank spaces are left between each letter of the alphabet to accommodate more additions, so it is unlikely at this point that the currently used portion of the block will need to be extended past U+F0490. (*NOTE: The contents of this zone are firmly established, although there is ample space for additional entries.*)

The use of Glagolitic Ligatures has been extensively documented for the standard text letter forms (i.e. the lower case), but its use in the "upper" (or titling) case seems to be uncommon. Only five "upper case" examples are included in this font. As a matter of practicality, if one wishes to use

ligatures in titles or drop-caps, the use of these "lower case" ligatures at a larger point size is more than sufficient to accomplish the task at hand.

11. Extra Characters

Printed editions of Glagolitic prayer books include at least nine specialized symbols, only one of which is included in the Unicode Standard. If the user would like to use these, they may be entered directly from the PUA. Since these symbols are largely decorative dingbats, we see no value to encoding them in Unicode. These symbols are used for two purposes.

1) Symbols used to add emphasis, usually at the beginning of a paragraph or section of text.

	U+261E	This symbol is usually used to indicate "Note:".
*	U+F0134 (PUA)	This is a multi-purpose symbol, which can also be use as a decorative symbol. Its shape is not equivalent to any of the Crosses already included in the Unicode Standard.
•	U+F0135 (PUA)	This symbol is usually used as a marker for a subsection of a chapter. This is somewhat analogous to modern ¶ (U+00B6).
•	U+F0136 (PUA)	This symbol is usually used as a marker for a subsection of a chapter. This is somewhat analogous to modern ¶ (U+00B6).

2) Symbols used for decorative purposes.

82	U+F0137(PUA)	This is used as a decorative flourish at the end of a chapter. When repeated, this can form a decorative border or line of separation.
46	U+F0138 (PUA)	This is used as a decorative flourish at the end of a chapter.
	U+F0139(PUA)	This is used as a decorative flourish at the end of a chapter.
<u>Z</u>	U+F013A (PUA)	When repeated, this can form a decorative border or line of separation.
•	U+F013B (PUA)	This is used as a decorative flourish at the end of a chapter.

12. Examples of Glagolitic Texts

i. Test of Round Glagolitic and Cyrillic Side-by-Side (Codex Zographensis [NLR Glag. 1], f. 77r)

Images: http://expositions.nlr.ru/ex_manus/Zograph_Gospel/_Project/page_Manuscripts.php? izo=D2D92E28-51F6-4085-B3D7-B2AAB8DA9BDD&nCodeList=152

Slavonic transcription: Quattuor Evangeliorum Codex Glagoliticus olim Zographensis nunc Petropolitanus. Characteribus cyrillicis transcriptum notis criticis prolegomenis appendicibus auctum adiuvante summi ministerii borussici liberalitate edidit V. Jagić. Berolini: Apud Weidmannos. 1879. P. 45.

Зачало Еважлив. тс хва сна бжив.

eજevba ea∆44 · ዋeજ ፎቪቪት 34å62e4 \mathbf{x} ያይመት ተመንፈት የተመሰው የእንደ የ \mathbf{x} መንፈት የ የመንፈት የ ሞክል ማብ ማብ ተ

ജ്യായെ സ്വാദ് സ്വാദ് സ്വാദ് വി വര്ട്ട് വി വി വര്ട്ട് വി വര്ട്ട് വി വര്ട്ട് വി വര്ട്ട് വി വര്ട്ട് വി വര്ട്ട് გთე%€ 3%3 ∙

жкоже естъ псано въ пророцъхъ. се йзъ посълж <u>ахл</u>ъ моі. пръдь лицемь моімь. іже оуготовитъ ПЖТЬ ТВОІ. ПРЕДЪ ТОБОІЖ.

Гласъ въпижштаго въ пустъји. Оуготовајте пять

ii. Test of Angular Glagolitic and Latin Side-by-Size (Apostolos, 1 Thess. 4:1-3)

Source: Afanas'yeva T. I., V. V. Kozak, and A. N. Sobolev. Глаголическая письменность Западных Балкан X—XVI веков. Учебно-методическое пособие. СПб.: Havka. 2016.

штерия при в при Ховов, пын влато пыхвото ит ит ит гног, êkože priêste čto ot nas', kako podobaet' vam' Errey. **ट्टम्म** шт X ШΧ €Ш४ШКЫ മേലേയോക്ക് പ്രത്യാപ്പു ըփեթ. மாசுகி evaenury ot voia božiê, svet'ba vaša, i v'zdr'žati se vam' ot Хலை கொணையா. இல் கல் வையை வர்பு கண்ண இரு lûbodêêniê. रुव्या स्मित्र का का का का का का का जाने का का जाने जा का **Фрезтавита.**

z izbitačastvuete pače. Vêste bo koterie zapovêdi dah' vam' gospodem' Isus Hristom'. Se bo est'

iii. Test of Missal Angular Glagolitic

Source: Misal po zakonu rimskoga dvora (first printed Missal), Croatia, 1483, f. 394 (as reproduced in Afanas'yeva T. I., et al. Op. cit., plate 11). (This source demonstrates the use of ligatures.)

न्त्रमुख ४४५७म्बर अध्यात स्थाप प्रतमेकर MBE. Jam+

(P พือที่ நியர் நியர் குறித்து இருநியர் குறித்து (Milsa za dobro stanie grada, or[a]ts[io]. யுத்த 🖺 சுடியாற்று க சுழுடியுக்கு நக்கூடி Semogi v[e]čni p[ož]e sazid[i]telû i stražu er[u]s[a]l[i]ma grada višnago hod[a]taistvom['] шхгэтыйх х етигу чьонун фт шину х b[la]ž[e]nie m[a]rie vinud[ê]vi i b[la]ž[e]n[a]go ห 🕏 krsogona m[u]č[eni]ka tvoego i b[la]ž[e]nago ம்காறைக்கள் வ க்வை க காழுகம் மாக்கம் முற்றான்கள் ulingrani si grad, i s zinni kingi nikuli silo u zdravie i mir[']. g[?]m.

Table A: Round, Angular and Missal Angular Glagolitic Characters

Upper Case Characters:

	Glagolitic Gault set		Glagolitic ic Set 3)		ngular Glagolitic ylistic Set 4)	Cyrillic ¹⁰ (transliteration)
U+2Coo	ф	U+F0200	Ф	U+F0270	qЪ	a
U+2C01	Ш	U+F0201	۳	U+F0271	毘	В
U+2C02	စု	U+F0202	Ф	U+F0272	P	R
U+2Co3	9 ₀	U+F0203	The state of the s	U+F0273	见	Г
U+2C04	₀	U+F0204	Ф	U+F0274	Ф	Д
U+2C05	3	U+F0205	Э	U+F0275	Э	E
U+2C06	*	U+F0206	ń	U+F0276	ක්	ж
U+2C07	⋄	U+F0207	В	U+F0277	ж	S, Z
U+2Co8	ذ	U+F0208	Do	U+F0278	Ъ	द (3)
U+2C09	P	U+F0209	Ф.	U+F0279	Ψ	И, І, І
U+2CoA	%	U+F020A	#	U+F027A	₩	И, І, І
U+2CoB	8	U+F020B	X	U+F027B	Х	И, І, І
U+2CoC	ď	U+Fo2oC	IP	U+F027C	ΠP	ᡮ ¹¹
U+2CoD	þ	U+F020D	Ъ	U+F027D	Ъ	К
U+2CoE	A	U+Fo2oE	Ш	U+F027E	ශී	Λ
U+2CoF	ॹ	U+Fo2oF	₩	U+F027F	₩	М
U+2C10	₅	U+F0210	₽	U+F0280	₽	N
U+2C11	9	U+F0211	IK	U+F0281	IK	0
U+2C12	ф.	U+F0212	IIn	U+F0282	По	П
U+2C13	Ь	U+F0213	Ъ	U+F0283	Б	Р
U+2C14	8	U+F0214	ନ	U+F0284	ଜ	C
U+2C15	σο	U+F0215	Ш	U+F0285		Т
U+2C16	3	U+F0216	X	U+F0286	₩	OY, ¥, Y
U+2C17	off v	U+F0217	Ф	U+F0287	Ф	Φ
U+2C18	Ь	U+F0218	Ь	U+F0288	Ь	x
U+2C19	0	U+F0219		U+F0289	Ф	Ö , W ¹²
U+2C1A	П	U+F021A	d I	U+Fo28A	Л	(П)

¹⁰⁾ Cyrillic transliterations are based primarily on: Ivanova T. A. Старославянский язык. 4-е издание. СПб., 2005.

¹¹⁾ This letter has been revived in modern times as Th, h.

¹²⁾ There is some difference of opinion regarding whether this character represents "o" (omega) or "ot"; the majority of sources suggest "ot", and the majority of scholars interpret it as such, but there is a possibility that "o" is valid in some circumstances.

U+2C1B	&	U+F021B	ď	U+Fo28B	₩	ψ (шт)
U+2C1C	V	U+F021C	V	U+Fo28C	y	Ц
U+2C1D	4	U+F021D	Ф	U+Fo28D	8	Y
U+2C1E	Ш	U+F021E	Ш	U+Fo28E	Ш	Ш
U+2C1F	a	U+F021F	Z.	U+Fo28F	e∄	Ъ
U+2C20	ન્ક	U+F0220	- X	U+F0290	뀪	Ь
U+2C21	A	U+F0221	Ъ	U+F0291	Ж	₩.
U+2C22	坏	U+F0222	ğ	U+F0292	Ģ	(x)
U+2C23	\mathcal{F}	U+F0223	D .	U+F0293	щ	Ю
U+2C24	€	U+F0224	£	U+F0294	œ	Ж
U+2C25	æ	U+F0225	٠E	U+F0295	r c E	(A)
U+2C26	♦	U+F0226	☆	U+F0296	杂	J
U+2C27	3 €	U+F0227	3€	U+F0297	Э •C	I/ X
U+2C28	∌€	U+F0228	3 K	U+F0298	ЖE	Ж
U+2C29	%€	U+F0229	4 ⊁€	U+F0299	Æ€	Ѭ
U+2C2A	••	U+F022A	o∏o	U+F029A	⊍∐ ⊎	θ
U+2C2B	8 .	U+F022B	X .	U+F029B	ૠ .	V
U+2C2C	7	U+F022C	Ţ	U+F029C	I	Ь, Ъ, ′
U+2C2D	Ħ	U+F022D	Ħ	U+F029D	Ħ	(A)
U+2C2E	M	U+F022E	Ω	U+F029E	Ω	(M)
U+2C2F	វិ	U+F022F	ŢŢ	U+Fo29F	ĬĬ	Y, "et cetera"

Lower Case Characters:

	Glagolitic fault set	_	Glagolitic ic Set 3)	· ·	ngular Glagolitic	Cyrillic (transliteration)
U+2C30	ተ	U+F0230	ф	U+Fo2Ao	ф	a
U+2C31	е	U+F0231	æ	U+F02A1	世	Б
U+2C32		U+F0232	ш	U+Fo2A2	ш	R
U+2C33	90	U+F0233	%	U+Fo2A3	9-1	Г
U+2C34		U+F0234	Шь	U+Fo2A4	ш	А
U+2C35	Э	U+F0235	Э	U+Fo2A5	Э	€, €
U+2C36	æ	U+F0236	Ж	U+Fo2A6	施	ж
U+2C37	❖	U+F0237	В	U+Fo2A7	出	s, z ,
U+2C38	ذ	U+F0238	₽u	U+Fo2A8	₽o	z (3)
U+2C39	ሞ	U+F0239	ф	U+Fo2A9	Ψ.	И, І, І
U+2C3A	%	U+F023A	TP	U+F02AA	TP	И, І, І

U+2C3B	8	U+Fo23B	X	U+Fo2AB	x	И, I, L
U+2C3C	ď	U+Fo23C	ΠP	U+Fo2AC	ΠP	¥
U+2C3D	þ	U+F023D	4	U+Fo2AD	z,	К
U+2C3E	&	U+Fo23E	ф	U+Fo2AE	ф	Л
U+2C3F	%	U+Fo23F		U+Fo2AF	***	М
U+2C40	£	U+F0240	¥	U+Fo2Bo	Ł	N
U+2C41	э	U+F0241	R	U+Fo2B1	В	0
U+2C42	4p	U+F0242	П	U+Fo2B2	П	п
U+2C43	Ь	U+F0243	Ь	U+Fo2B3	Б	ρ
U+2C44	R	U+F0244	ନ	U+Fo2B4	ବ	C
U+2C45	σο	U+F0245	m	U+Fo2B5	m	т
U+2C46	æ	U+F0246	3 9	U+Fo2B6	29	ογ, ε, γ
U+2C47	o∰o	U+F0247	Ф	U+Fo2B7	Φ	ф, ө
U+2C48	Ь	U+F0258	Ы	U+Fo2B8	Ъ	x
U+2C49	©	U+F0249	· 약	U+Fo2B9		ω , ω
U+2C4A	dI	U+Fo24A	Л	U+Fo2BA	А	(n)
U+2C4B	₩	U+Fo24B	₩	U+Fo2BB	₩	ψ (шт)
U+2C4C	v	U+Fo24C	q y	U+Fo2BC	Ų	ц
U+2C4D	4	U+Fo24D	₩	U+Fo2BD	₩	Y
U+2C4E	Ш	U+F024E	Ш	U+Fo2BE	Ш	Ш
U+2C4F	ಿ	U+F024F	-Z	U+Fo2BF	υΣ	Ъ
U+2C50	ન	U+F0250	- ⊠	U+Fo2Co	rХ	Ь
U+2C51	A	U+F0251	В	U+Fo2C1	Ь	ъ (д)
U+2C52	坏	U+F0252	¤	U+Fo2C2	th	x
U+2C53	ľ	U+F0253	贝	U+Fo2C3		Ю
U+2C54	€	U+F0254	€	U+Fo2C4	€	А
U+2C55	Æ	U+F0255	Æ	U+Fo2C5	r€	(A)
U+2C56	♦	U+F0256	杂	U+Fo2C6	&	J
U+2C57	3€	U+F0257	3€	U+Fo2C7	3€	HA
U+2C58	€	U+F0258	æ	U+Fo2C8	3 €	ж
U+2C59	4 €	U+F0259	æ€	U+Fo2C9	₽ €	HX.
U+2C5A	Φ	U+Fo25A	offa	U+Fo2CA	о∰о	•
U+2C5B	8-	U+Fo25B	と	U+Fo2CB	₿ı	v
U+2C5C	1	U+Fo25C	T	U+Fo2CC	Т	ь, ъ, '
U+2C5D	Þ	U+Fo25D	Þ	U+Fo2CD	B	(a)
U+2C5E	М	U+Fo25E	M	U+Fo2CE	М	(м)

U+2C2F u	U+Fo22F u	U+Fo29F u	y, "et cetera"
Combining Superscript "t"			
U+1E015 "	U+F022F ో	U+Fo29F ో	T

Table B: Baromić Broken Ligatures (truncated characters)

These ligature components are accessed via SALT (Stylistic Alternatives). (In LibreOffice, change the font name to "Shafarik:salt=x", where 'x' is a number.)

```
U+2C30 Small Azu 4:
                 salt=1: н
                              abbreviated version right (U+Fo<sub>2</sub>Eo)
                              abbreviated version left (U+Fo<sub>2</sub>E<sub>1</sub>)
                 salt=2: h
                 salt=3: н
                              standard truncated version right (U+Fo<sub>2</sub>E<sub>2</sub>)
                              standard truncated version left (U+Fo2E3)
                 salt=4: h
                 salt=5: rt
                              high truncated version right (U+Fo<sub>2</sub>E<sub>4</sub>)
                              high truncated version left (U+Fo<sub>2</sub>E<sub>5</sub>)
                 salt=6: †i
U+2C32 Small Vedi v:
                 salt=1: п
                              truncated version right (U+Fo<sub>2</sub>E<sub>7</sub>)
                 salt=2: II truncated version left (U+Fo<sub>2</sub>E8)
U+2C34 Small Dobro ه:
                 salt=2:13 h standard truncated version (U+Fo2EA)
                 salt=3: h high truncated version (U+Fo2EB)
U+2C36 Small Zhivete &:
                 salt=1: if truncated version right (U+Fo2ED)
                 salt=2: i truncated version left (U+Fo2EE)
U+2C3E Small Liudie A:
                              truncated version right (U+Fo<sub>2</sub>Fo)
                 salt=1: ௴
                 salt=2: \(\frac{1}{2}\) truncated version left (U+Fo<sub>2</sub>F<sub>1</sub>)
U+2C45 Small Tvrido ∞:
                 salt=1: \( \text{truncated version right (U+Fo2F3)} \)
                 salt=2: u truncated version left (U+Fo<sub>2</sub>F<sub>4</sub>)
```

¹³⁾ Here we have to start salt at 2 because salt=1 is taken up by the alternative at U+EC63.

Table C: Angular Glagolitic Ligatures

Glagolitic ligatures are not automatically generated, but are discretionary (as needed). Since the default Round Glagolitic does not use ligatures, one should not insert them when typesetting texts using that script. However, the Angular Script (ss03) and the Angular Missal Script (ss04) both make liberal use of these ligatures by using ss05 instead of default, ss03 or ss04 text. When ligatures are needed, they are accessed by designating the font as "Shafarik:ss05" in the font toolbar in LibreOffice (or a similar method in other software). NOTE: The user should not directly access the characters using the PUA codepoints listed below (in the left column), unless the software does not provide support for OpenType features.

Three ligatures have variants between the standard Angular and Missal Angular styles (ss03 and ss04); these are marked in the main table below with green highlighting. The first version of the ligature is produced normally (by designating it with sso5), while the second version is produced by designating at as "ss05&ss04". These three characters are:

default	no ligature formed	፠&	የያ	፠፟ቕ
sso3 sso4	no ligature formed no ligature formed	900r 900r	р апь Рапь	9PY
sso5, sso5&sso3	usual ligature formed	死	Впр	1111 7
ss05&ss04	variant ligature formed	ώπ	ро ъ	THP

PUA Codepoint	Character Sequence (before ss03, ss04 or ss05 is applied)	Glagolitic Ligature	Test (ss05 applied)	Transliteration and Comments
u+F0300	4世	rte	rt e	аб
u+F0301	ተ ሇ	rtaa	rtua	ar
u+F0302	ተ ሇተ	rtuarh	rtaati	ава
u+F0303	+ %%	тиш	та	ark
u+F0304	ተ ው	ф	ф	ад
u+F0305	ተ %	нт	ищ	аж
u+F0306	ተ ፠ው	Щт	щт	ажд
u+F0307	ተ ኦ	К	К	ак
u+F0308	ተ ቆ	rtdb	rtdb	ax
u+F0309	ተ ጬ	ıtм	тм	ам
u+Fo30A	ተ ታ	Ъ	Ж	an
u+Fo3oB	₩	фа	ф	ап
u+Fo3oC	ψω	rtara	rtuu	ат
u+Fo3oD	+Ш	тш	тш	аш

u+Fo3oE	÷Ъ	ф	ф	аю
u+F0315	世本	뻔	<u>ਦ</u> ੀ	БА
u+F0316	ш ж	ළු	स्र्या	БЖ
u+F0317	ш а	சூ	सी	БЛ
u+F0318	Ľ ዴଡ	eт	स्टीप	БЛВ
u+F0319	ய க ர	சூ	சி	БЛЮ
u+Fo31A		சி ந்	சி ந்	БЛЮД
u+Fo31B	шэ	¹ 2	垣	60
u+Fo31C	шь	б	ъ́	БР
u+F0323	_የ	шh	шһ	ва
u+F0324	vv	ппп	0.00	BB
u+F0325	ччь	ааб	anti	ввр
u+F0326	va .	шь	ш	ВД
u+F0327	የ ሌሙዬ	aandb	aa d b	ВДТЛ
u+F0328	v <i>*</i>	m <u>y</u>	am am	вж
u+F0329	v&&	வர்க	ம்றா	вжд
u+Fo32A	₽ %	αβα	п р а	в
u+Fo32B	Ք જન	ոթս ի	դիս ի	вза
u+Fo32C	֎	பிரும்	படுவ	взв
u+Fo32D	v જ&	цђиъ	Ωθαъ	взд
u+Fo32E	೪ %&+	ађањ	пран	вуда
u+Fo32F	v જ&v	ப்ரம்ம	Ո ֆսես	вздв
u+F0330	ሁ ኖሕ	п) db	при в	вζл
u+F0331	ਪ ਲ	пх	пх	ВИ
u+F0332	೪ 8&	ПХР	пхъ	вид
u+F0333	V A	шfb	adh	ВЛ
u+F0334	೪ ೩ሑ	adh	mpp.	ВЛА
u+F0335	ษลช	пцх	шұх	ВЛИ
u+F0336	va y	шђ	யிற	влю
u+F0337	மக ்டக	யிக	யிந	влюд
u+F0338	ษอ	ш	all .	ВО
u+F0339	೪ 9&	аљ	адъ	вод
u+Fo33A	ტეთ	ඛ්ත	aða	вот
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u+F0417	ተ ₈ 3&	पित्रम	पिक्र	плод

¹⁴⁾ Ligatures in Slavic writing scripts almost always read from bottom-to-top (in this case M-L), but in rare circumstances they were interpreted according to the Grek model of top-to-bottom, such as in the word for "Jerusalem": 36 🛱 🛣 •

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u+F0418	ኬීග	पिएक	पिक	ПЛТ
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u+F041A	ተሜል	L ega	L ega	ПМХ
u+F041B	የ ን	þ	lg .	по
u+F041C	РЭУ	Гр	咖	ПОВ
u+F041D	РЭ УЬ	L	陋	повр
u+F041E	የ 9&	lpp	lgp	под
u+F041F	ሞንሌተ	Ідч	प्रिम	пода
u+F0420	ங்கின	موا	प्रिक	пот
u+F0421	ს მთმ	الإلا	199	пото
u+F0422	հ թաԲ	lg _Q	मिर्	потр
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u+F0450		வந்	व्यक्ति	тврд
u+F0451	സെ	шь	шь	тд
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u+Fo48F	ЪфР	ற	妽	ютр	
u+F0490	ሆሆ			юю	

Appendix: Resources for Advanced Study

1) Books

Hercigonija E. Povijest hrvatske književnosti. Knj. 2. Srednjovjekovna književnost. Zagreb, 1975.

Vaillant A. *Manuel du vieux slave*. Paris, 1948 = Вайан А. *Руководство по старославянскому языку*. M., 1952 and reprints.

Žagar, Mateo. *Introduction to Glagolitic Paleography*. (forthcoming publication) (https://www.winter-verlag.de/de/detail/978-3-8253-4608-9/Zagar Glagolitic Paleography/)

Афанасьева Т. И., Козак В. В., Соболев А. Н. *Глаголическая письменность западных Балкан. Учебно-методическое пособие.* СПб, Наука. 2016.

Иванова Т. А. Старославянский язык. 4-е издание. СПб., 2005.

Щепкин В. Н. Русская палеография. М., 1967.

2) Internet Resources

Старославянский язык (http://ekislova.ru/sla/oldchurchslavonik)
Памятники старославянского языка: книги (http://ekislova.ru/sla/books)
Манускрипт - Древние славянские памятники (http://manuscripts.ru/)
ivan.vucica.net :: Glagolitic Transliterator (https://ivan.vucica.net/glagolitic/)
Библиотека Фронтистеса (https://ksana-k.narod.ru/)

3) Videos for Basic Instruction

https://www.youtube.com/watch?v=VDcqlgxgkBk https://www.youtube.com/watch?v=E7YHUeLxRv4 https://www.youtube.com/watch?v=PFAeVf8qCHQ https://www.youtube.com/watch?v=YCSFuAvlFOo