

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: [̅̅̅ versus ̅̅̅] (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 (̅̅̅) is used in both OCS and CS typography, the Vzmet (̅̅̅) should only be used with OCS texts.

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: ꙗ̄ꙗ̄ (with “ss”) versus ꙗ̄ꙗ̄ (composed normally).]

The higher numbers are as follows:

A) The Thousands Sign (ты́сяца) can be rendered in two different ways: as a separate character (as it is always done in CS texts: *а), or attached (ligated) to the following letter (i.e., numeral) which it “modifies”. The attached form is provided via Stylistic Set 1 (а), while an alternate attached form is provided via Stylistic Set 2 (а). (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: *а̇саа̇), since it it appears to be visually redundant as an initial numeral marker (*а̇саа̇); the Thousands Sign and the Titlo or Vzmet already indicate that this is a numeral.

Thousands Sign: U+0482 Cyrillic Thousands Sign												*
ss01: (just apply the ss01 to get ligated forms)												*
ss02: (alternate ligated forms)												ѣ
Value:	1,000	2,000	3,000	4,000	5,000	6,000	alt.	7,000	alt.	8,000	9,000	
a) With the Titlo:												
default:	*а̄	*в̄	*г̄	*д̄	*е̄	*ѕ̄	*џ̄	*з̄	*џ̄	*ӣ	*ѳ̄	
ss01:	а̄	в̄	г̄	д̄	е̄	ѕ̄	џ̄	з̄	џ̄	ӣ	ѳ̄	
ss02:	а̄	в̄	г̄	д̄	е̄	ѕ̄	џ̄	з̄	џ̄	ӣ	ѳ̄	
b) With the Vzmet:												
default:	*а̄	*в̄	*г̄	*д̄	*е̄	*ѕ̄	*џ̄	*з̄	*џ̄	*ӣ	*ѳ̄	
ss01:	а̄	в̄	г̄	д̄	е̄	ѕ̄	џ̄	з̄	џ̄	ӣ	ѳ̄	
ss02:	а̄	в̄	г̄	д̄	е̄	ѕ̄	џ̄	з̄	џ̄	ӣ	ѳ̄	

B) The Ten Thousands Sign (ТМĀ, ТЪМĀ), 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.

<u>Ten Thousands Sign: U+20DD Combining Enclosing Circle</u>											○
SSO1:											○
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ

C) The Hundred Thousands Sign (ЛЕРЕЌОНЪ or НЕСВѢДЪ) functions analogously to the previous character.

<u>Hundred Thousands Sign: U+0488 Combining Cyrillic Hundred Thousands Sign</u>											⋯
SSO1:											⋯
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ

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

<u>Millions Sign: U+0489 Combining Cyrillic Millions Sign</u>											⋯
SSO1:											⋯
SSO2:											⋯
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO2:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ

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

<u>Ten Millions Sign: U+A670 Combining Cyrillic Ten Millions Sign</u>											⋯
SSO1:											⋯
SSO2:											⋯
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO2:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ

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

<u>Hundred Millions Sign: U+A671 Combining Cyrillic Hundred Millions Sign</u>											☉
SSO1:											☉
SSO2:											☉
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ
SSO2:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ


G) The Thousand Millions Sign (тыл̑́ тѣмль, тыл̑́ тѣмль) 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 𐐆̑́.)

<u>Thousand Millions Sign: U+A672 Combining Cyrillic Thousand Millions Sign</u>											☉	Ⓜ
SSO1:											☉	Ⓜ
SSO2:											☉	Ⓜ
default:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ	
SSO1:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ	
SSO2:	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓙ	Ⓚ	Ⓛ	Ⓜ	

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	⸣	Double Stacked Comma	This can be combined with the Raised Comma: ⸣⸢
U+205A	:	Two Dot Punctuation	
U+205D	⋮	Tricolon	
U+205E	⋮	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	⋮	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	¶	Pilcrow Sign	
U+F0135	Ⓔ	Decorative Section Sign	Only available in the PUA
U+F0136	Ⓕ	Decorative Section Sign	Only available in the PUA

U+261E		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	~	Tilde Operator	:~ ::~
U+223D	~	Reversed Tilde	:~ ::~
U+2241	~	Not Tilde	:~ ::~
U+2E43	~	Dash With Left Upturn	May be used alone or as :~ ::~
	~	Decorative End Mark (<i>salt</i>)	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	✱	Maltese Cross	
U+F0134	✱	Decorative Cross	Only available in the PUA
U+EDFF	✱	Decorative Cross	Only available in the PUA
		Other Symbols	
U+2E46	✱	Inverted Low Kavyka With Kavyka Above	
U+2E48	◊	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_\(Unicode_block\)](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 Koinj 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 Small Letters		
U+2C00	AZU	ⱦ	U+2C30	AZU	ⱦ
U+2C01	BUKY	Ⱨ	U+2C31	BUKY	Ⱨ
U+2C02	VEDE	ⱨ	U+2C32	VEDE	ⱨ
U+2C03	GLAGOLI	Ⱪ	U+2C33	GLAGOLI	Ⱪ
U+2C04	DOBRO	ⱪ	U+2C34	DOBRO	ⱪ
U+2C05	YESTU	Ⱬ	U+2C35	YESTU	Ⱬ
U+2C06	ZHIVETE	ⱬ	U+2C36	ZHIVETE	ⱬ
U+2C07	DZELO	Ɑ	U+2C37	DZELO	Ɑ
U+2C08	ZEMLJA	Ɱ	U+2C38	ZEMLJA	Ɱ
U+2C09	IZHE	Ɐ	U+2C39	IZHE	Ɐ
U+2C0A	INITIAL IZHE	Ɒ	U+2C3A	INITIAL IZHE	Ɒ
U+2C0B	I	ⱱ	U+2C3B	I	ⱱ
U+2C0C	DJERVI	Ⱳ	U+2C3C	DJERVI	Ⱳ
U+2C0D	KAKO	ⱳ	U+2C3D	KAKO	ⱳ
U+2C0E	LJUDIJE	ⱴ	U+2C3E	LJUDIJE	ⱴ
U+2C0F	MYSLITE	Ⱶ	U+2C3F	MYSLITE	Ⱶ
U+2C10	NASHI	ⱶ	U+2C40	NASHI	ⱶ
U+2C11	ONU	ⱷ	U+2C41	ONU	ⱷ
U+2C12	POKOJI	ⱸ	U+2C42	POKOJI	ⱸ
U+2C13	RITSI	ⱹ	U+2C43	RITSI	ⱹ
U+2C14	SLOVO	ⱺ	U+2C44	SLOVO	ⱺ
U+2C15	TVRIDO	ⱻ	U+2C45	TVRIDO	ⱻ
U+2C16	UKU	ⱼ	U+2C46	UKU	ⱼ
U+2C17	FRITU	ⱽ	U+2C47	FRITU	ⱽ
U+2C18	HERU	Ȿ	U+2C48	HERU	Ȿ
U+2C19	OTU	Ɀ	U+2C49	OTU	Ɀ
U+2C1A	PE	Ⰰ	U+2C4A	PE	Ⰰ
U+2C1B	SHTA	Ⰱ	U+2C4B	SHTA	Ⰱ
U+2C1C	TSI	Ⰲ	U+2C4C	TSI	Ⰲ
U+2C1D	CHRIVI	Ⰳ	U+2C4D	CHRIVI	Ⰳ
U+2C1E	SHA	Ⰴ	U+2C4E	SHA	Ⰴ

U+2C1F	YERU	Ბ	U+2C4F	YERU	Ბ
U+2C20	YERI	Ბ	U+2C50	YERI	Ბ
U+2C21	YATI	Ა	U+2C51	YATI	Ა
U+2C22	SPIDERY HA	Ბ	U+2C52	SPIDERY HA	Ბ
U+2C23	YU	Ბ	U+2C53	YU	Ბ
U+2C24	SMALL YUS	Ბ	U+2C54	SMALL YUS	Ბ
U+2C25	SMALL YUS WITH TAIL	Ბ	U+2C55	SMALL YUS WITH TAIL	Ბ
U+2C26	YO	Ბ	U+2C56	YO	Ბ
U+2C27	IOTATED SMALL YUS	Ბ	U+2C57	IOTATED SMALL YUS	Ბ
U+2C28	BIG YUS	Ბ	U+2C58	BIG YUS	Ბ
U+2C29	IOTATED BIG YUS	Ბ	U+2C59	IOTATED BIG YUS	Ბ
U+2C2A	FITA	Ბ	U+2C5A	FITA	Ბ
U+2C2B	IZHITSA	Ბ	U+2C5B	IZHITSA	Ბ
U+2C2C	SHTAPIC	Ბ	U+2C5C	SHTAPIC	Ბ
U+2C2D	TROKUTASTI A	Ბ	U+2C5D	TROKUTASTI A	Ბ
U+2C2E	LATINATE MYSLITE	Ბ	U+2C5E	LATINATE MYSLITE	Ბ
U+2C2F	CAUDATE CHRIVI	Ბ	U+2C5F	CAUDATE CHRIVI	Ბ

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: **Ф ф** , Glagolitic: **Გ Დ**]; 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: **Გ Დ** , Fita: **Გ Დ**); 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 ‘**Გ Დ**’ form; this form is available via the Stylistic Alternates (*salt*) feature or from the PUA at U+EC66/U+EC77.

2) The *Shtapic* (**Ბ Ბ**) 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 (**Ѣ ѣ**), 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 consonant⁷. It is essentially a Glagolitic *Yerok/Payerok*.

3) The *Trokutasti A* (**Ბ Ბ**) is an unfortunate addition of an alternate letter form (a Stylistic Alternative) which is found in the *Trokutasti* (Triangular) style of lettering.

4) The *Latinated Myslite* (**Ბ Ბ**) is another unfortunate addition of an alternate letter form. Observing that the regular character form of the *Myslite* (Round: **ᲑᲑᲑᲑ**, Angular: **ᲑᲑᲑᲑ**, Alt-1: **ᲑᲑᲑᲑ**, Alt-2: **ᲑᲑᲑᲑ**) 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”, **Ѹ ѹ**) 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”.⁸ 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 2CIA – 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’ <ѧ>, its origin and relatives*](#) by Sebastian Kempgen

9) In the vowel system of Old Church Slavonic, the “yers” (**ѣ, ѥ** and **ѣ, ѣ**) recorded ultra-short reduced vowels *[ū] and *[ī]. 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 **ѣ** and **ѥ** 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 **ѣ, ѥ** and **Ѧ, ѧ** 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 **ѣ** was encoded in Unicode to transcribe yers in instances where it is impossible to tell the difference between **ѣ** and **ѥ**, 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_Protoslavic

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.

U+1E00C	DJERVI	◌ [̂]	U+1E021	YATI	◌ [̂]
U+1E00D	KAKO	◌ [̂]	U+1E023	YU	◌ [̂]
U+1E00E	LJUDIJE	◌ [̂]	U+1E024	SMALL YUS	◌ [̂]
U+1E00F	MYSLITE	◌ [̂]	U+1E026	YO	◌ [̂]
U+1E010	NASHI	◌ [̂]	U+1E027	IOTATED SMALL YUS	◌ [̂]
U+1E011	ONU	◌ [̂]	U+1E028	BIG YUS	◌ [̂]
U+1E012	POKOJI	◌ [̂]	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:

		<i>normal</i>	<i>ss03</i>	<i>ss04</i>
U+0303	Combining Tilde	̃	̃	̃
U+0483	Combining Cyrillic Titlo	̆	̆	̆
U+A66F	Combining Cyrillic Vzmet	̇	̇	̇

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)	̃	U+ECA3
Glagolitic Glagoli (U+2C33)	̃	U+ECA4
Glagolitic Dobro (U+2C34)	̃	U+ECA5
Glagolitic Zhivete (U+2C36)	̃	U+ECA6

Description	Form	PUA Codepoint
Glaolitic Zemlja (U+2C38)	Ѡ	U+ECA7
Glagolitic Izhe (U+2C39)	ѡ	U+ECA8
Glagolitic Initial Izhe (U+2C3A)	Ѣ	U+ECA9
Glagolitic Djervi (U+2C3C)	ѣ	U+ECAA
Alternate form of U+2C3C (<i>salt</i>)	Ѥ	U+ECAB
Glagolitic Ljudije (U+2C3E)	ѥ	U+ECAC
Glagolitic Myslite (U+2C3F)	Ѧ	U+ECAD
Glagolitic Tvrido (U+2C45)	ѧ	U+ECAE
Glagolitic Heru (U+2C48) (ss04)	Ѩ	U+ECAF
Glagolitic Otu (U+2C49) (ss04)	ѩ	U+ECB0
Glagolitic Yu (U+2C53)	Ѫ	U+ECB1
Glagolitic Shtapic (U+2C5C)	ѫ	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	Ѭ	U+ECC0
Vedi Tvrido	ѭ	U+ECC1
Vedi Tvrido Ritsi	Ѯ	U+ECC2
Mysliti Ljudije	ѯ	U+ECC3
Mysliti Zhivete	Ѱ	U+ECC4
Mysliti Izhe Ljudije	ѱ	U+ECC5
Mysliti Slovo	Ѳ	U+ECC6
Mysliti Chrivi	ѳ	U+ECC7
Tvrido Vedi	Ѵ	U+ECC8
Tvrido Vedi Ritsi	ѵ	U+ECC9
Glagoli Ritsi	Ѷ	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		̃	Ѡ̃	Ꝫ̃
	salt=1	Alternate Combining Tilde (flipped variant)	U+ECA1	̃	Ѡ̃	Ꝫ̃
	salt=2	Alternate Combining Tilde (narrow flipped variant)	U+ECA0	̃	Ѡ̃	Ꝫ̃
	salt=3	Alternate Combining Tilde (wide flipped variant)	U+ECA2	̃	Ѡ̃	Ꝫ̃
	salt=4	Alternate Combining Tilde (narrow variant)	U+E010	̃	Ѡ̃	Ꝫ̃
	salt=5	Alternate Combining Tilde (wide variant)	U+E011	̃	Ѡ̃	Ꝫ̃
	salt=6	Combining Galgolic Tilde (plain variant)	U+E012	̃	Ѡ̃	Ꝫ̃
	salt=7	Combining Galgolic Tilde (ornamental variant)	U+E013	̃	Ѡ̃	Ꝫ̃
	salt=8	Combining Galgolic Tilde (another ornamental variant)	U+E014	̃	Ѡ̃	Ꝫ̃
U+0304		Combining Macron		̄	Ѡ̄	Ꝫ̄
U+0305		Combining Overline		̅	Ѡ̅	Ꝫ̅
U+0360		Combining Double Titlo		̆	Ѡ̆	Ꝫ̆
	salt=1	Alternate Combining Double Tilde	U+E015	̆	Ѡ̆	Ꝫ̆
U+0361		Combining Double Inverted Breve		̇	Ѡ̇	Ꝫ̇
U+0483		Combining Cyrillic Titlo		̈	Ѡ̈	Ꝫ̈
	salt=1	Alternate Combining Cyrillic Titlo (wide variant 1)	U+E016	̈	Ѡ̈	Ꝫ̈
	salt=2	Alternate Combining Cyrillic Titlo (wide variant 2)	U+E017	̈	Ѡ̈	Ꝫ̈
	salt=3	Alternate Combining Cyrillic Titlo (wide variant 2 reversed)	U+E018	̈	Ѡ̈	Ꝫ̈

	salt=4	Alternate Combining Cyrillic Titlo (wide decorative reversed variant)	U+E019			
	salt=5	Alternate Combining Cyrillic Titlo (flat decorative variant 1)	U+E01A			
	salt=6	Alternate Combining Cyrillic Titlo (flat decorative variant 2)	U+E01B			
	salt=7	Alternate Combining Cyrillic Titlo (flat decorative variant 3)	U+E01C			
U+0487		Combining Cyrillic Pokrytie				
	salt=1	Alternate Combining Cyrillic Pokrytie (rounded variant)	U+E01D			
	salt=2	Alternate Combining Cyrillic Pokrytie (angular variant)	U+E01E			
U+A66F		Combining Cyrillic Vzmet				
	salt=1	Alternate Combining Cyrillic Vzmet (wide variant)	U+E01F			
U+FE26		Combining Conjoining Macron				
U+FE27		Combining Cyrillic Titlo Left Half				
U+FE28		Combining Cyrillic Titlo Right Half				

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.

<i>Codepoint:</i>	<i>Main Form</i>	<i>Variant Form (Description)</i>	<i>PUA Codepoint</i>
ROUND SCRIPT			
U+2C03	Ꝑ	ꝑ (Alt Round Capital Glagoli)	U+EC60
U+2C33	ꝓ	Ꝕ (Alt Round Small Glagoli)	U+EC61
U+2C04	Ꝓ	ꝓ (Alt Round Capital Dobro)	U+EC62
U+2C34	Ꝕ	ꝕ (Alt Round Small Dobro)	U+EC63
U+2C0F	Ꝟ	ꝟ (Alt Round Capital Myslete)	U+EC64
U+2C3F	Ꝡ	ꝡ (Alt Round Small Myslete)	U+EC65
U+2C17	Ꝣ	ꝣ (Alt Round Capital Friti)	U+EC66
U+2C47	Ꝥ	ꝥ (Alt Round Small Friti)	U+EC67
U+2C19	Ꝧ	ꝧ (Alt Round Capital Otu)	U+EC68
U+2C49	Ꝩ	ꝩ (Alt Round Small Otu)	U+EC69
U+2C20	Ꝫ	ꝫ (Alt Round Capital Soft Sign)	U+EC6A
U+2C50	Ꝭ	ꝭ (Alt Round Small Soft Sign)	U+EC6B
U+2C22	Ꝯ	ꝯ (Alt Round Capital Spidery Ha)	U+EC6C
U+2C52	ꝰ	ꝱ (Alt Round Small Spidery Ha)	U+EC6D
U+2C24	ꝲ	ꝳ (Alt Round Capital Small Yus)	U+EC6E
U+2C54	ꝴ	ꝵ (Alt Round Small Small Yus)	U+EC6F
ANGULAR SCRIPT			
U+2C30	ꝶ	salt=7: ꝷ Alt Angular Small Azu (tall variant) [salt=7 is used here because salt=2...6 are used for the Baromić ligatures; see Table B.]	U+EC76
U+2C02	ꝸ	Ꝺ Alt Angular Capital Vedi (connected variant)	U+EC77
U+2C05	ꝺ	Ꝼ Alt Angular Capital Yest (uncrossed variant)	U+EC78
U+2C35	ꝼ	Ᵹ Alt Angular Small Yest (uncrossed variant)	U+EC79
U+2C08	Ꝿ	ꝿ Alt Angular Capital Dzelo	U+EC7A
U+2C38	Ꝡ	ꝡ Alt Angular Small Dzelo	U+EC7B
U+2C0C	Ꝣ	ꝣ Alt Angular Capital Gerv	U+EC7C
U+2C3C	Ꝥ	ꝥ Alt Angular Small Gerv	U+EC7D
U+2C0F	Ꝟ	Salt=2 ꝟ Alt-1 Angular Capital Myslete	U+EC7E
U+2C0F	Ꝟ	Salt=3 Ꝡ Alt-2 Angular Capital Myslete	U+EC7F

U+2C11	᠑	᠑ Alt Angular Capital Onu	U+EC80
U+2C16	᠒	᠒ Alt Angular Capital Ouk	U+EC81
U+2C46	᠔	᠔ Alt Angular Small Ouk	U+EC82
U+2C1D	᠕	᠕ Alt Angular Large Chrivi	U+EC8E
U+2C4D	᠖	᠖ Alt Angular Small Chrivi	U+EC8F
U+2C1F	᠗	Salt=1 ᠗ Alt-1 Angular Capital Hard Sign	U+EC83
U+2C1F	᠘	Salt=2 ᠘ Alt-2 Angular Capital Hard Sign	U+EC85
U+2C1F	᠙	Salt=3 ᠙ Alt-3 Angular Capital Hard Sign	U+EC87
U+2C4F	᠚	Salt=1 ᠚ Alt-1 Angular Small Hard Sign	U+EC84
U+2C4F	᠛	Salt=2 ᠛ Alt-2 Angular Small Hard Sign	U+EC86
U+2C4F	᠜	Salt=3 ᠜ Alt-3 Angular Small Hard Sign	U+EC88
U+2C20	᠗	Salt=2 ᠗ Alt Angular Large Soft Sign	U+EC90
U+2C50	᠘	Salt=2 ᠘ Alt Angular Small Soft Sign	U+EC91
U+2C22	᠙	Salt=2 ᠙ Alt Angular Capital Spidery Kha	U+EC89
U+2C52	᠚	Salt=2 ᠚ Alt Angular Small Spidery Kha	U+EC8A
U+2C2C	᠛	᠛ Alt Angular Capital Shtapic	U+EC8B
U+2C5C	᠜	᠜ Alt Angular Small Shtapic	U+EC8C
U+2C2E	᠝	᠝ 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.

	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.
	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+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.

**Table A:
Round, Angular and Missal Angular Glagolitic Characters**

Upper Case Characters:

<u>Round Glagolitic</u> <i>(default set)</i>	<u>Angular Glagolitic</u> <i>(Stylistic Set 3)</i>	<u>Missal Angular Glagolitic</u> <i>(Stylistic Set 4)</i>	<u>Cyrillic</u> ¹⁰ <i>(transliteration)</i>
U+2C00 ⱦ	U+F0200 ⱦ	U+F0270 ⱦ	А
U+2C01 Ⱨ	U+F0201 Ⱨ	U+F0271 Ⱨ	Б
U+2C02 ⱨ	U+F0202 ⱨ	U+F0272 ⱨ	В
U+2C03 Ⱪ	U+F0203 Ⱪ	U+F0273 Ⱪ	Г
U+2C04 ⱪ	U+F0204 ⱪ	U+F0274 ⱪ	Д
U+2C05 Ⱬ	U+F0205 Ⱬ	U+F0275 Ⱬ	Е
U+2C06 ⱬ	U+F0206 ⱬ	U+F0276 ⱬ	Ж
U+2C07 Ɑ	U+F0207 Ɑ	U+F0277 Ɑ	З, Ꙑ
U+2C08 Ɱ	U+F0208 Ɱ	U+F0278 Ɱ	ꙑ (З)
U+2C09 Ɐ	U+F0209 Ɐ	U+F0279 Ɐ	И, І, Ѳ
U+2CoA Ɒ	U+F020A Ɒ	U+F027A Ɒ	И, І, Ѳ
U+2CoB ⱱ	U+F020B ⱱ	U+F027B ⱱ	И, І, Ѳ
U+2CoC Ⱳ	U+F020C Ⱳ	U+F027C Ⱳ	Ѧ ¹¹
U+2CoD ⱳ	U+F020D ⱳ	U+F027D ⱳ	К
U+2CoE ⱴ	U+F020E ⱴ	U+F027E ⱴ	Л
U+2CoF Ⱶ	U+F020F Ⱶ	U+F027F Ⱶ	М
U+2C10 ⱶ	U+F0210 ⱶ	U+F0280 ⱶ	Н
U+2C11 ⱷ	U+F0211 ⱷ	U+F0281 ⱷ	О
U+2C12 ⱸ	U+F0212 ⱸ	U+F0282 ⱸ	П
U+2C13 ⱹ	U+F0213 ⱹ	U+F0283 ⱹ	Р
U+2C14 ⱺ	U+F0214 ⱺ	U+F0284 ⱺ	С
U+2C15 ⱻ	U+F0215 ⱻ	U+F0285 ⱻ	Т
U+2C16 ⱼ	U+F0216 ⱼ	U+F0286 ⱼ	Ѡ, ѡ, Ѣ
U+2C17 ⱽ	U+F0217 ⱽ	U+F0287 ⱽ	Ѥ
U+2C18 Ȿ	U+F0218 Ȿ	U+F0288 Ȿ	Х
U+2C19 Ɀ	U+F0219 Ɀ	U+F0289 Ɀ	Ѧ, Ѧ ¹²
U+2C1A Ȿ	U+F021A Ȿ	U+F028A Ȿ	(Ѧ)

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 Ѓ, ħ.

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+2C3B	ᄃ	U+F023B	ᄃ	U+F02AB	ᄃ	И, I, Ъ
U+2C3C	ᄄ	U+F023C	ᄄ	U+F02AC	ᄄ	Ӏ
U+2C3D	ᄅ	U+F023D	ᄅ	U+F02AD	ᄅ	К
U+2C3E	ᄆ	U+F023E	ᄆ	U+F02AE	ᄆ	Л
U+2C3F	ᄇ	U+F023F	ᄇ	U+F02AF	ᄇ	М
U+2C40	ᄈ	U+F0240	ᄈ	U+F02B0	ᄈ	Н
U+2C41	ᄉ	U+F0241	ᄉ	U+F02B1	ᄉ	О
U+2C42	ᄊ	U+F0242	ᄊ	U+F02B2	ᄊ	П
U+2C43	ᄋ	U+F0243	ᄋ	U+F02B3	ᄋ	Р
U+2C44	ᄌ	U+F0244	ᄌ	U+F02B4	ᄌ	С
U+2C45	ᄍ	U+F0245	ᄍ	U+F02B5	ᄍ	Т
U+2C46	ᄎ	U+F0246	ᄎ	U+F02B6	ᄎ	ОУ, Ъ, Ү
U+2C47	ᄏ	U+F0247	ᄏ	U+F02B7	ᄏ	Ф, Ф
U+2C48	ᄐ	U+F0258	ᄐ	U+F02B8	ᄐ	Х
U+2C49	ᄑ	U+F0249	ᄑ	U+F02B9	ᄑ	Ѡ, ѡ
U+2C4A	ᄒ	U+F024A	ᄒ	U+F02BA	ᄒ	(п)
U+2C4B	ᄓ	U+F024B	ᄓ	U+F02BB	ᄓ	ш (шт)
U+2C4C	ᄔ	U+F024C	ᄔ	U+F02BC	ᄔ	ц
U+2C4D	ᄕ	U+F024D	ᄕ	U+F02BD	ᄕ	ч
U+2C4E	ᄖ	U+F024E	ᄖ	U+F02BE	ᄖ	ш
U+2C4F	ᄗ	U+F024F	ᄗ	U+F02BF	ᄗ	ъ
U+2C50	ᄘ	U+F0250	ᄘ	U+F02C0	ᄘ	ь
U+2C51	ᄙ	U+F0251	ᄙ	U+F02C1	ᄙ	Ѣ (ѣ)
U+2C52	ᄚ	U+F0252	ᄚ	U+F02C2	ᄚ	х
U+2C53	ᄛ	U+F0253	ᄛ	U+F02C3	ᄛ	ю
U+2C54	ᄜ	U+F0254	ᄜ	U+F02C4	ᄜ	Ѧ
U+2C55	ᄝ	U+F0255	ᄝ	U+F02C5	ᄝ	(ѧ)
U+2C56	ᄞ	U+F0256	ᄞ	U+F02C6	ᄞ	Ј
U+2C57	ᄟ	U+F0257	ᄟ	U+F02C7	ᄟ	Ѧ
U+2C58	ᄠ	U+F0258	ᄠ	U+F02C8	ᄠ	Ѧ
U+2C59	ᄡ	U+F0259	ᄡ	U+F02C9	ᄡ	Ѧ
U+2C5A	ᄢ	U+F025A	ᄢ	U+F02CA	ᄢ	Ф
U+2C5B	ᄣ	U+F025B	ᄣ	U+F02CB	ᄣ	Ѧ
U+2C5C	ᄤ	U+F025C	ᄤ	U+F02CC	ᄤ	ь, Ѣ, '
U+2C5D	ᄥ	U+F025D	ᄥ	U+F02CD	ᄥ	(Ѧ)
U+2C5E	ᄦ	U+F025E	ᄦ	U+F02CE	ᄦ	(М)

U+2C2F ɥ	U+F022F ɥ	U+F029F ɥ	ɣ, “et cetera”
Combining Superscript “t”			
U+1E015 ̥̇	U+F022F ̥̇	U+F029F ̥̇	ɣ

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 ɥ:

- salt=1: ɥ̇ abbreviated version right (U+F02E0)
- salt=2: ɥ̈ abbreviated version left (U+F02E1)
- salt=3: ɥ̉ standard truncated version right (U+F02E2)
- salt=4: ɥ̊ standard truncated version left (U+F02E3)
- salt=5: ɥ̋ high truncated version right (U+F02E4)
- salt=6: ɥ̌ high truncated version left (U+F02E5)

U+2C32 Small Vedi ɥ:

- salt=1: ɥ̇ truncated version right (U+F02E7)
- salt=2: ɥ̈ truncated version left (U+F02E8)

U+2C34 Small Dobro ɥ:

- salt=2:¹³ ɥ̈ standard truncated version (U+F02EA)
- salt=3: ɥ̉ high truncated version (U+F02EB)

U+2C36 Small Zhivete ɥ:

- salt=1: ɥ̇ truncated version right (U+F02ED)
- salt=2: ɥ̈ truncated version left (U+F02EE)

U+2C3E Small Liudie ɥ:

- salt=1: ɥ̇ truncated version right (U+F02F0)
- salt=2: ɥ̈ truncated version left (U+F02F1)

U+2C45 Small Tvrido ɥ:

- salt=1: ɥ̇ truncated version right (U+F02F3)
- salt=2: ɥ̈ truncated version left (U+F02F4)

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 ss05), while the second version is produced by designating at as “ss05&ss04”. These three characters are:

default	no ligature formed	ѿѿ	ѿѿ	ѿѿ
ss03	no ligature formed	ѿѿѿ	ѿѿѿ	ѿѿѿ
ss04	no ligature formed	ѿѿѿ	ѿѿѿ	ѿѿѿ
ss05, ss05&ss03	usual ligature formed	ѿѿ	ѿѿ	ѿѿѿ
ss05&ss04	variant ligature formed	ѿѿѿ	ѿѿѿ	ѿѿѿ

<i>PUA Codepoint</i>	<i>Character Sequence (before ss03, ss04 or ss05 is applied)</i>	<i>Glagolitic Ligature</i>	<i>Test (ss05 applied)</i>	<i>Transliteration and Comments</i>
u+F0300	ѿѿ	ѿѿ	ѿѿ	ѿѿ
u+F0301	ѿѿѿ	ѿѿѿ	ѿѿѿ	ѿѿѿ
u+F0302	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ
u+F0303	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ
u+F0304	ѿѿѿ	ѿѿѿ	ѿѿѿ	ѿѿѿ
u+F0305	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ
u+F0306	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ
u+F0307	ѿѿѿ	ѿѿѿ	ѿѿѿ	ѿѿѿ
u+F0308	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ	ѿѿѿѿ
u+F0309	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ
u+F030A	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ	ѿѿѿѿѿ
u+F030B	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ	ѿѿѿѿѿѿ
u+F030C	ѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿ
u+F030D	ѿѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿѿ	ѿѿѿѿѿѿѿѿ

u+F030E	ԻԽ	իք	իք	ԱԽ
u+F0315	ԵԻ	էի	էի	ԵԱ
u+F0316	ԵՅ	էն	էն	ԵՅ
u+F0317	ԵՖ	էփ	էփ	ԵՖ
u+F0318	ԵՖՎ	էփու	էփու	ԵՖՎ
u+F0319	ԵՖԽ	էփո	էփո	ԵՖԽ
u+F031A	ԵՖԽՅ	էփոն	էփոն	ԵՖԽՅ
u+F031B	ԵՅ	էլ	էլ	ԵՕ
u+F031C	ԵԵ	էլ	էլ	ԵԲ
u+F0323	ՎԻ	ուի	ուի	ՎԱ
u+F0324	ՎՎ	ուու	ուու	ՎՎ
u+F0325	ՎՎԵ	ոււն	ոււն	ՎՎԲ
u+F0326	ՎՅ	ուե	ուե	ՎԸ
u+F0327	ՎՅԵՍ	ուեփ	ուեփ	ՎԸԸ
u+F0328	ՎՅ	ույն	ույն	ՎՅ
u+F0329	ՎՅԵ	ույն	ույն	ՎՅԸ
u+F032A	ՎԹ	ութ	ութ	ՎՅ
u+F032B	ՎԹԻ	ութի	ութի	ՎՅԱ
u+F032C	ՎԹՎ	ութու	ութու	ՎՅՎ
u+F032D	ՎԹԵ	ութե	ութե	ՎՅԸ
u+F032E	ՎԹԵԻ	ութեի	ութեի	ՎՅԸԱ
u+F032F	ՎԹԵՎ	ութեու	ութեու	ՎՅԸՎ
u+F0330	ՎԹԵ	ութե	ութե	ՎՅԸ
u+F0331	ՎՃ	ուճ	ուճ	ՎԻ
u+F0332	ՎՃԵ	ուճե	ուճե	ՎԻԸ
u+F0333	ՎՏ	ուփ	ուփ	ՎԱ
u+F0334	ՎՏԻ	ուփի	ուփի	ՎԱԱ
u+F0335	ՎՏՃ	ուփճ	ուփճ	ՎԱԻ
u+F0336	ՎՏԽ	ուփո	ուփո	ՎԱԽ
u+F0337	ՎՏԽՅ	ուփոն	ուփոն	ՎԱԽՅ
u+F0338	ՎՅ	ույ	ույ	ՎՕ
u+F0339	ՎՅԵ	ույն	ույն	ՎՕԸ
u+F033A	ՎՅԵՍ	ույս	ույս	ՎՕԸ
u+F033B	ՎԵ	ուն	ուն	ՎԲ

u+F0375	ሖተ	ሸሐ	ሸሐ	ሖላ
u+F0376	ሖሆ	ሸሠ	ሸሠ	ሖጆ
u+F0377	ሸሐሐ	ሸሸ	ሸሸ	ሖሏ
u+F0378	ሖሐ	ሸሐ	ሸሐ	ሖላ (default form: sso5)
u+F0379	ሖሐ	ሸሐሐ	ሸሐሐ	ሖላ (variant: sso5&ss04)
u+F037A	ሖሐተ	ሸሐተ	ሸሐተ	ሖላላ
u+F037B	ሖጓ	ሸጓ	ሸጓ	ሖሄ
u+F037C	ሖገ	ሸገ	ሸገ	ሖዛ
u+F037D	ሖሐ	ሸሐሐ	ሸሐሐ	ሖላላ
u+F037E	ሖሐሆ	ሸሐሆ	ሸሐሆ	ሖላሐ
u+F037F	ሖጓ	ሸጓ	ሸጓ	ሖሀ
u+F0380	ሖሐ	ሸሐ	ሸሐ	ሖሐ
u+F038D	ሖተ	ሸሐ	ሸሐ	ሖላ
u+F038E	ሖሆ	ሸሠ	ሸሠ	ሖጆ
u+F038F	ሖሆጓ	ሸሠገ	ሸሠገ	ሖጆሀ
u+F0390	ሖሆሐ	ሸሠሐ	ሸሠሐ	ሖጆሐ
u+F0391	ሖሆሐሐ	ሸሠሐሐ	ሸሠሐሐ	ሖጆሐሐ
u+F0392	ሖሐ	ሸሐሐ	ሸሐሐ	ሖላ (default form: sso5)
u+F0393	ሖሐ	ሸሐሐሐ	ሸሐሐሐ	ሖላ (variant: sso5&ss04)
u+F0394	ሖሐተ	ሸሐተ	ሸሐተ	ሖላላ
u+F0395	ሖሐ	ሸሐሐ	ሸሐሐ	ሖላሐ
u+F0396	ሖገ	ሸገ	ሸገ	ሖሐ
u+F0307	ሖሐ	ሸሐሐ	ሸሐሐ	ሖላላ
u+F0398	ሖሐተ	ሸሐተ	ሸሐተ	ሖላላ
u+F0399	ሖሐሆ	ሸሐሆ	ሸሐሆ	ሖላሐ
u+F039A	ሖሐሆገ	ሸሐሆገ	ሸሐሆገ	ሖላሐሐ
u+F039B	ሖሐሆ	ሸሐሆ	ሸሐሆ	ሖላሐ
u+F039C	ሖሐሆሐ	ሸሐሆሐ	ሸሐሆሐ	ሖላሐሐ
u+F039D	ሖሐሆ	ሸሐሆ	ሸሐሆ	ሖላሐ
u+F039E	ሖጓ	ሸጓ	ሸጓ	ሖሐ
u+F039F	ሖሐ	ሸሐ	ሸሐ	ሖሐ
u+F03A0	ሖሐተ	ሸሐተ	ሸሐተ	ሖሐላ
u+F03A1	ሖሐ	ሸሐ	ሸሐ	ሖሐ (ሖሐሐ, ሖሐሐ)

u+F03A8	ԳՁ	Գ	Գ	ԻՋ
u+F03A9	ԳՖ	Գ	Գ	ԻԼ
u+F03AA	ԿՁ	Կ	Կ	ԻՋ
u+F03AB	ԿԲ	ԿԲ	ԿԲ	ԻՆ (default form: ss05)
u+F03AC	ԿԲ	ԿԲ	ԿԲ	ԻՆ (variant: ss05&ss04)
u+F03B2	ՅԳ	Ճ	Ճ	ԻՎ
u+F03B3	ՅՖ	Ճ	Ճ	ԻԸ
u+F03B4	ԶՁ	Ճ	Ճ	ԻՋ
u+F03B5	ՅԶԳ	Ճ	Ճ	ԻՋԵ
u+F03B6	ՅՖ	Ճ	Ճ	ԻԼ
u+F03B7	ՅՖԾ	Ճ	Ճ	ԻԼԻ
u+F03B8	ՅՖԳ	Ճ	Ճ	ԻԼՕ
u+F03B9	ՇԾ	Շ	Շ	ԻՏ
u+F03BA	ՇԾՖ	ՇՖ	ՇՖ	ԻՏԸ
u+F03C1	ԼՖ	ԼԲ	ԼԲ	ԷԼ (ԲԼ, ԲԼ > ԸԲԷԼ)
u+F03C8	ԼԻ	ԼԻ	ԼԻ	ԼԸ
u+F03C9	ԼԲ	ԼԻ	ԼԻ	ԼՎ
u+F03CA	ԼԲԼ	ԼԻԼ	ԼԻԼ	ԼՎԼ
u+F03CB	ԼԲԾ	ԼԻԾ	ԼԻԾ	ԼՎՏ
u+F03CC	ԼՖ	ԼԻ	ԼԻ	ԼԸ
u+F03CD	ԼՁ	ԼԻ	ԼԻ	ԼՋ
u+F03CE	ԼԾ	ԼԻ	ԼԻ	ԼԻ
u+F03CF	ԼԳ	ԼԻ	ԼԻ	ԼՕ
u+F03D0	ԼԾ	ԼԻ	ԼԻ	ԼՏ
u+F03D1	ԼԾԳ	ԼԻԾ	ԼԻԾ	ԼՏՎ
u+F03D2	ԼԾՖ	ԼԻՖ	ԼԻՖ	ԼՏԲ
u+F03D3	ԼԲ	ԼԻ	ԼԻ	ԼՅ
u+F03D4	ԼԲԼ	ԼԻԼ	ԼԻԼ	ԼՅԸ
u+F03D5	ԼԲԾ	ԼԻԾ	ԼԻԾ	ԼՅՏ
u+F03D6	ԼԲԾԳ	ԼԻԾ	ԼԻԾ	ԼՅՕՏ
u+F03DE	ՄՁ	Մ	Մ	ՄՋ
u+F03DF	ՄՁՖ	ՄՖ	ՄՖ	ՄՋԸ

u+F044C	ሙተ	መተ	መተ	ጥለ
u+F044D	ሙኖ	መመ	መመ	ጥፍ
u+F044E	ሙኖፃ	መሸ	መሸ	ጥፍዐ
u+F044F	ሙኖኔ	መነ	መነ	ጥፍዖ
u+F0450	ሙኖኔሴ	መነኔ	መነኔ	ጥፍዖለ
u+F0451	ሙሴ	መኔ	መኔ	ጥለ
u+F0452	ሙጅ	መሸ	መሸ	ጥገ
u+F0453	ሙጸ	መጸ	መጸ	ጥዝ
u+F0454	ሙቆ	መቤ	መቤ	ጥለ
u+F0455	ሙቆፆ	መቤፆ	መቤፆ	ጥለዐ
u+F0456	ሙፃ	መሸ	መሸ	ጥዐ
u+F0457	ሙኔ	መነ	መነ	ጥዖ
u+F0458	ሙኔመ	መነመ	መነመ	ጥዖጥ
u+F0459	ሙመ	መመ	መመ	ጥጥ
u+F0460	ሠተ	ሠተ	ሠተ	ሠለ
u+F0461	ሠኖ	ሠመ	ሠመ	ሠፍ
u+F0462	ሠቆጸ	ሠቆጸ	ሠቆጸ	ሠለዝ
u+F0463	ሠኔ	ሠነ	ሠነ	ሠዖ
u+F0464	ሠመ	ሠመ	ሠመ	ሠጥ
u+F0465	ሠመፃ	ሠሸ	ሠሸ	ሠጥዐ
u+F0476	ቃጽ	ቃጽ	ቃጽ	ካ
u+F047D	ገኖ	ገበ	ገበ	ጽፎ (ለፍ)
u+F047E	ገጽፃ	ገጽፃ	ገጽፃ	ጽገፍ (ለገፍ)
u+F047F	ገተ	ገጅ	ገጅ	ጽገ (ለገ)
u+F0480	ገቆ	ገቤ	ገቤ	ጽለ (ለለ)
u+F0481	ገመ	ገመ	ገመ	ጽጥ (ለጥ)
u+F0482	ገመፃ	ገሸ	ገሸ	ጽጥዐ (ለጥዐ)
u+F0489	ፆሴ	ፆኔ	ፆኔ	ዐለ
u+F048A	ፆጅ	ፆነ	ፆነ	ዐገ
u+F048B	ፆጽፃ	ፆነፃ	ፆነፃ	ዐገፍ
u+F048C	ፆቆ	ፆቤ	ፆቤ	ዐለ

u+F048D	ᄂᆞ	ᄂᆞ	ᄂᆞ	ᄂᆞ
u+F048E	ᄂᆞᄂ	ᄂᆞᄂ	ᄂᆞᄂ	ᄂᆞᄂ
u+F048F	ᄂᆞᄂᄂ	ᄂᆞᄂᄂ	ᄂᆞᄂᄂ	ᄂᆞᄂᄂ
u+F0490	ᄂᆞᄂᄂᄂ	ᄂᆞᄂᄂᄂᄂ	ᄂᆞᄂᄂᄂᄂ	ᄂᆞᄂᄂᄂᄂ

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*. М., 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 (<http://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>