

# A Keyboard Driver for all OCS Characters

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A photograph of an open book with a wooden cover. The left page is a blue-lined sheet of paper. A quill pen lies diagonally across the page. A yellow text box is overlaid on the left side of the page.

**Suggestion to the  
Commission:**

**"Develop a single  
keyboard driver for  
all OCS characters"  
(Cynthia  
Vakareliyska)**

**[Commission for Computer Supported Processing of Mediæval  
Slavonic Manuscripts and Early Printed Books]**

**And the solution is:**

**accents  
superscripts**



**old  
chars**

**nasal  
vowels**

**lowercase  
uppercase**

**just kidding..**



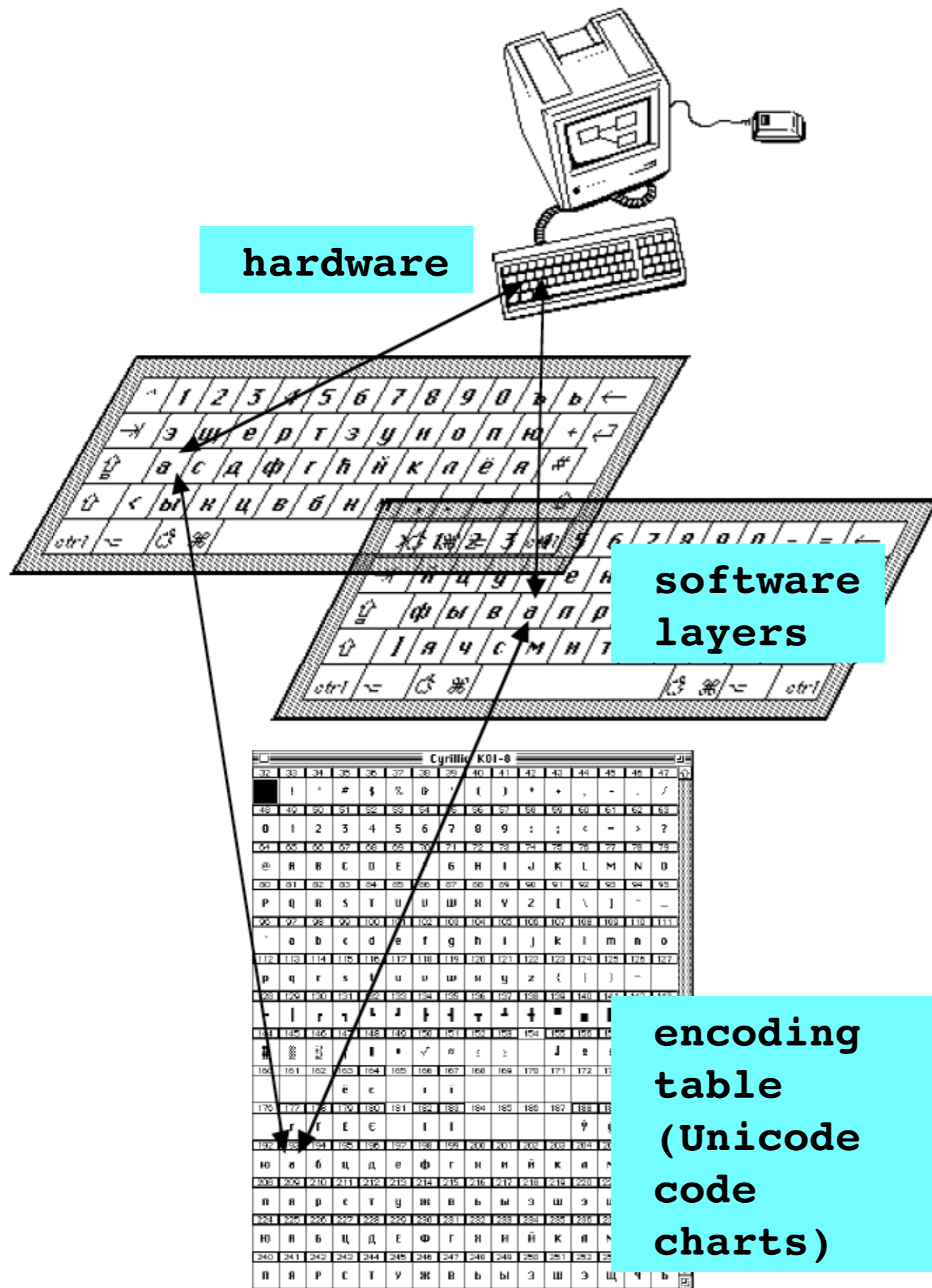
**Working group:**

**Sebastian > Mac driver + Cynthia as beta tester**

**Daniel > Windows driver + Ralph as beta tester**

**Occasional and additional input & feedback:**

**Sorin, Viktor, Andrej, David**



## Keyboard driver

The software layer between the physical hardware (keyboard) and what is displayed (on the screen or in a file)

## Keyboard driver

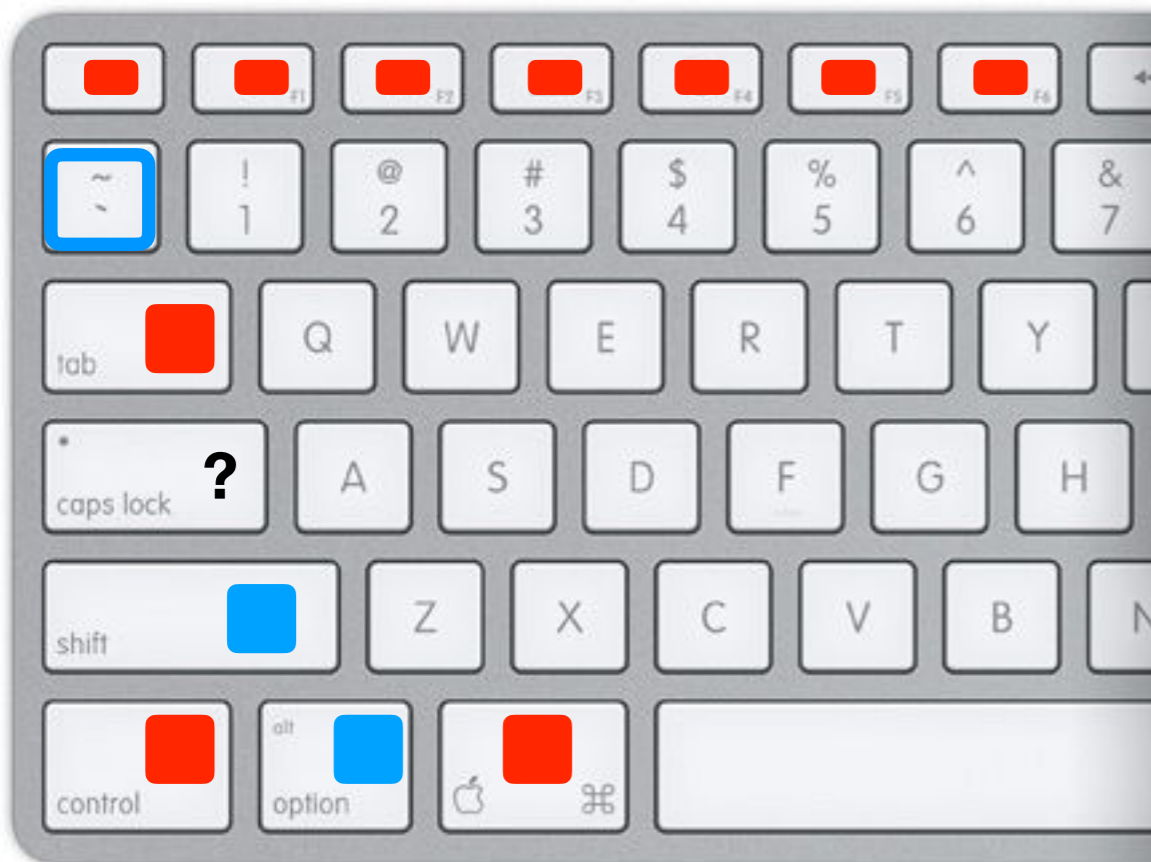
puts the chars on the keys;  
no input without software drivers;  
we use them all the time  
but don't see them.

## Keyboard drivers: basic techniques

four layers: standard, shift, alt(gr), alt(gr)-shift

dead keys Mac/Win: type `~` + aeiou > display áéíóú

(does not actually put an accent over a vowel  
but retrieves the predefined accented vowel from the  
encoding table; not a "compose" function)

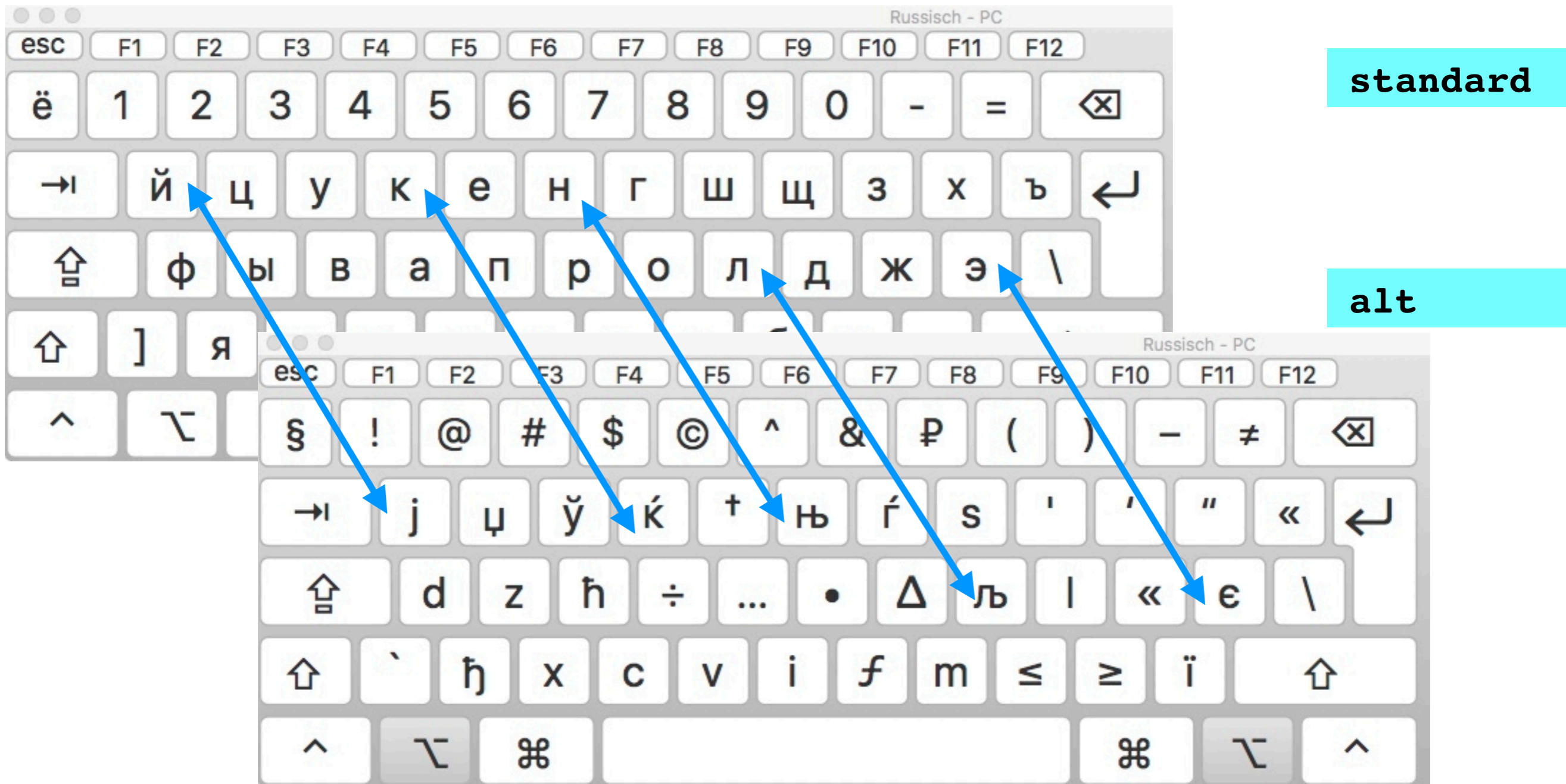


### Consensus:

- leave control & command keys etc. untouched
- don't use the function keys

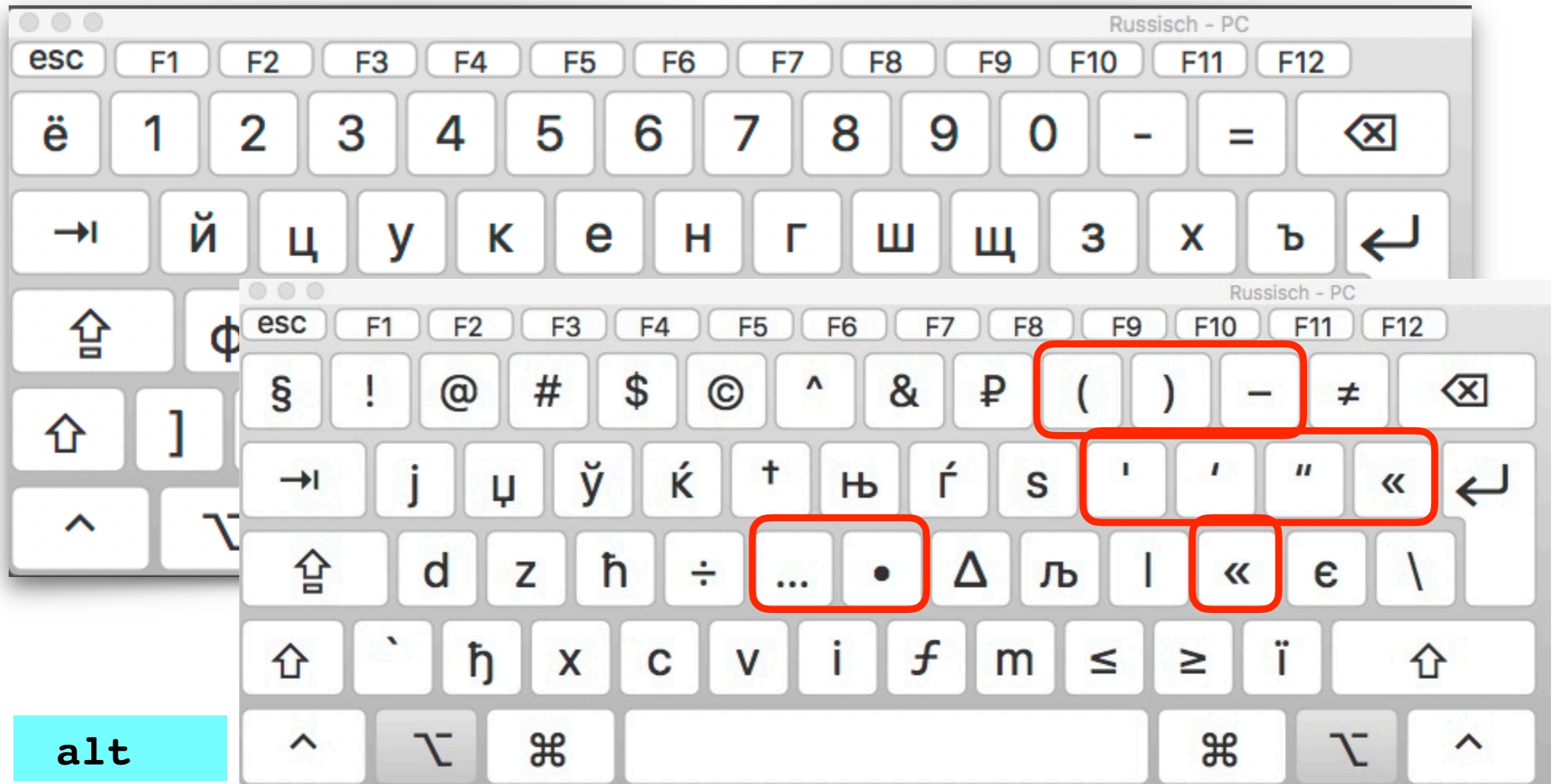
## Facts:

- platform-specifics exist (Option / Alt - layer)
- prohibits completely identical kb drivers on all platforms, if preserved



## Consensus :

- leave placement of standard punctuation, brackets etc. intact
- or use them for the same purpose (but another glyph)



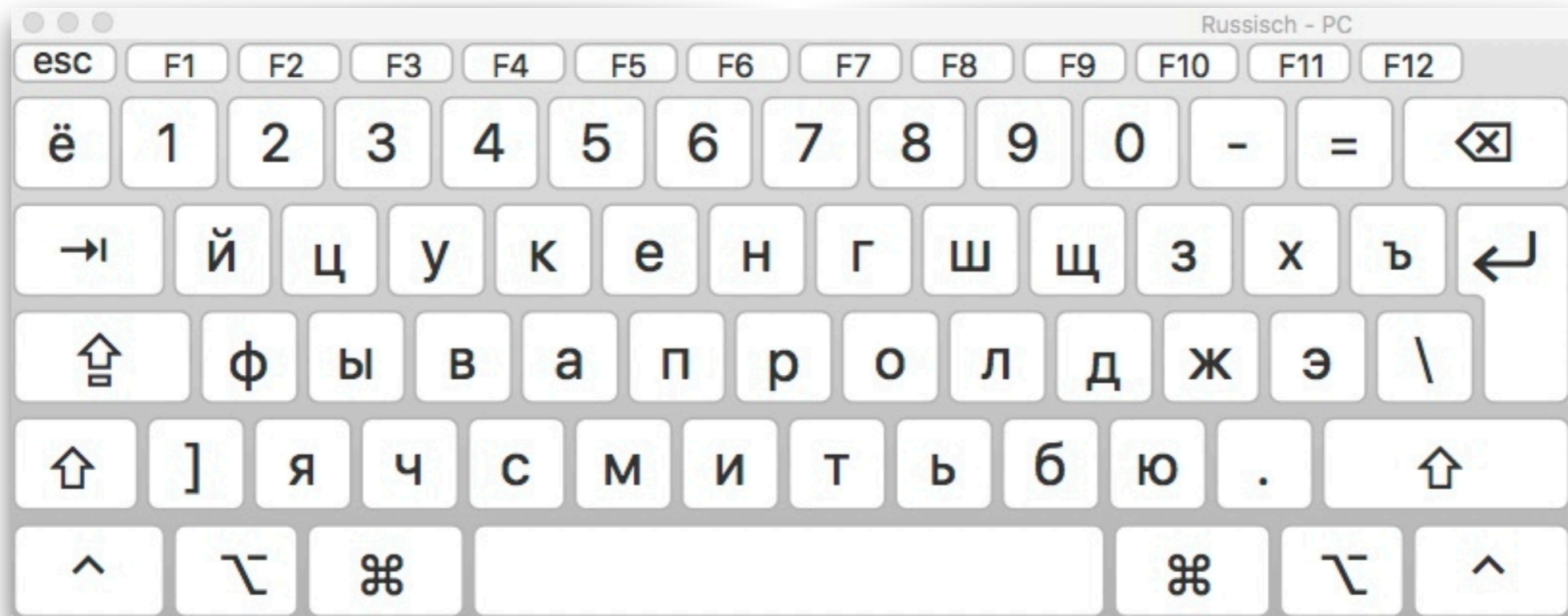
## Facts:

- platform-specifics exist (AltGr/Shift layer)
- > prohibits completely identical kb drivers on all platforms, if preserved
- Linux "Compose" concept not used/supported on the Mac
- "Press and hold" concept not really customizable on the Mac and Ukelele does not support its creation



## Facts:

- platform-specifics exist (AltGr/Shift layer)
- > prohibits completely identical kb drivers on all platforms, if preserved
- Other concepts not fully supported everywhere



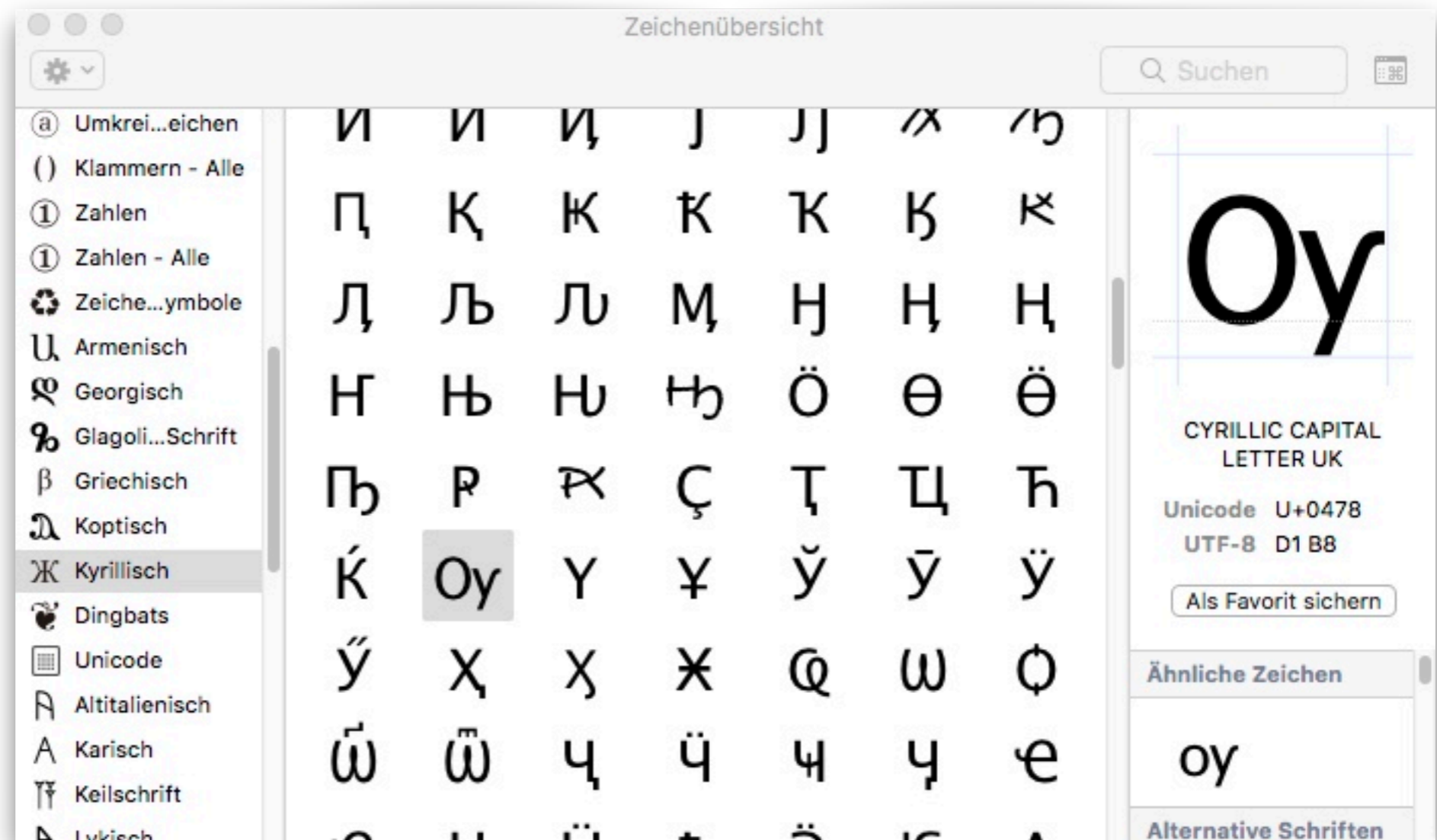
## Problem:

- "one and the same solution for all platforms" vs.
- "best solution for each platform" 😊

not actively discussed/decided so far

## Facts:

- alternate input methods exist on each platform
- standard Cyrillic drivers continue to be available
- switching keyboards = usually one click/mouse movement/key combination



character  
palette

## Facts:

- OCS kb drivers exist - various sources
- many users have an ad-hoc solution
- can have perceived or real limitations
- Commission cannot force any solution onto users



## Consensus

blueprints to build on:

**Russian**, Bulgarian, Serbian PC KB drivers

Latin (QUERTY, QUERTZ) drivers

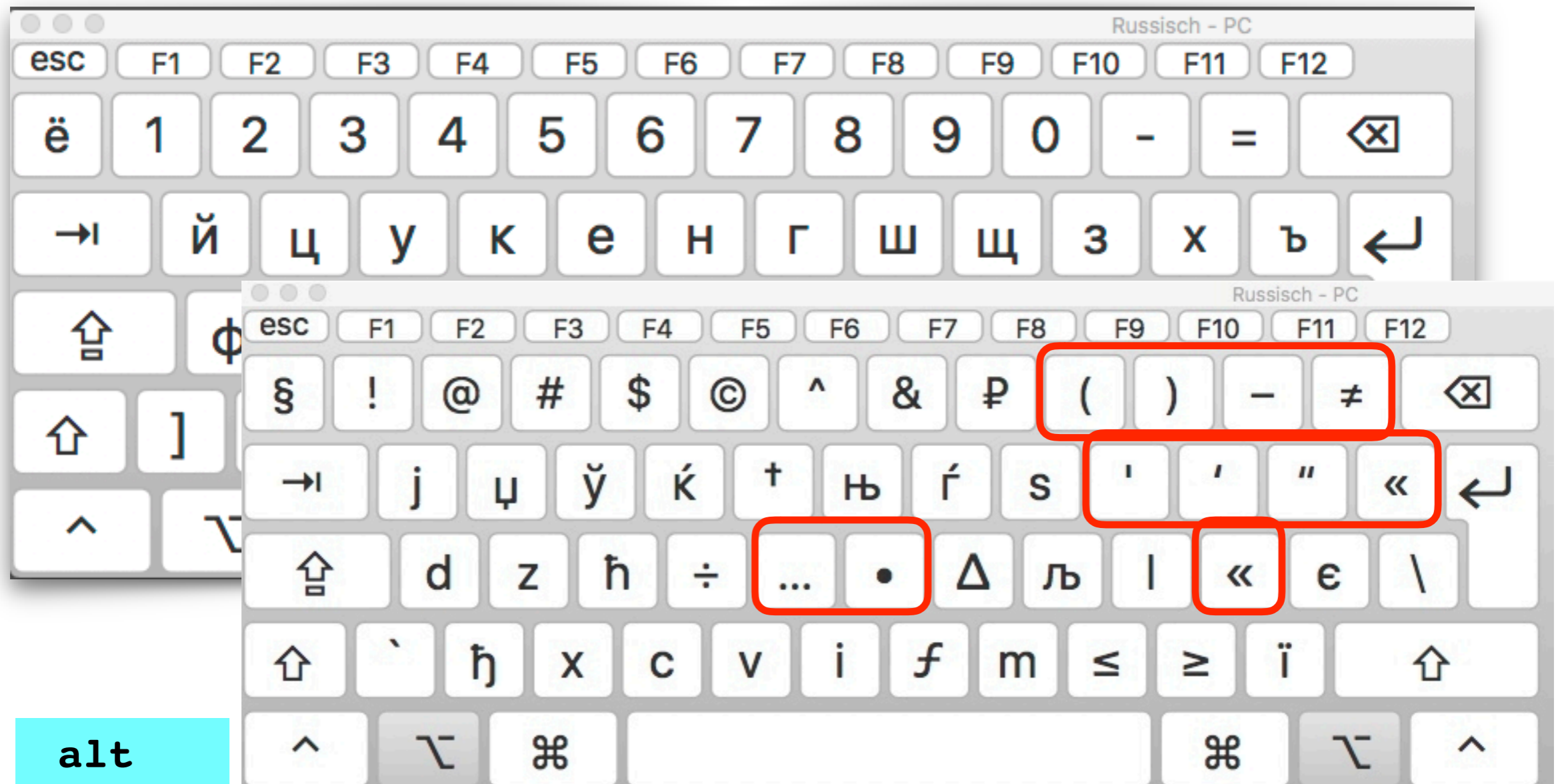
Cyrillic (and maybe Glagolitic later)

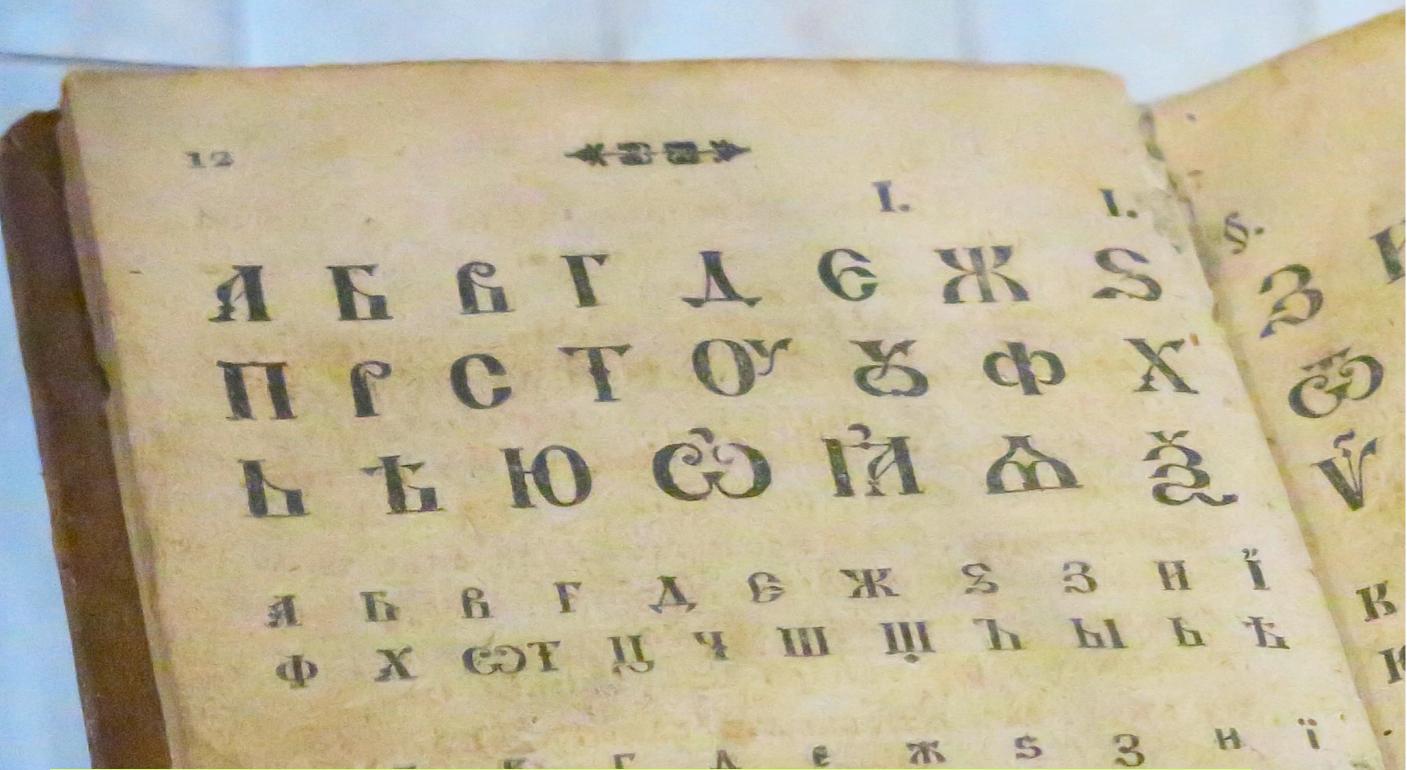
- one (1) driver preferred
- mnemonics & ergonomics!



## Strategy:

- delete unnecessary (modern) characters (ë)
- add new (OCS) characters (ѣ)
- make placements easy to learn (e - ѳ)
- leave placement of standard punctuation, brackets etc. intact





**Tasks: define the chars. that are needed**

- inline characters (А ... Ё)
- superscripts & modifiers
- punctuation plus special symbols (Ѵ ∷ ✱ ...)
- accents (plus combinations “ ” ...), titla etc.
- other convenient symbols (editorial etc.)

## Dot clusters

✱	reference mark	203B
✱✱	asterism	2042
*	low asterisk	204E
* *	two askterisks vert.	2051
*	flower punct. mark	2055
∴	three dot punct.	2056
⋄	four dot punct.	2058
⋆	five dot punct.	2059
∴	two dot punct.	205A
⋄	four dot mark	205B
⌘	dotted cross	205C
∴	three colon	205D
⋮	four vert. dots	205E
∴	two dots over one punct.	2E2A
∴	one dot over two dots	2E2B
∴	squared four dot punct.	2E2C
⋄	five dot mark	2E2D
⊕	circled cross pomme	1F540
⊕	cross pomme with half circle below	1F542
+	cross pomme	1F542
⊕	notched left semicircle with 3 dots	1F543
⊕	notched right semicircle with 3 dots	1F544
⊕	left half-circle with 4 dots	1F903
⊕	left half-circle with 3 dots	1F904
⊕	left half-circle with 2 dots	1F905
⊕	left half-circle with dot	1F906



А Б В Г Д Е Ж З  
 П Р С Т ОУ Ф Х  
 Ъ Ы Ю ѿ ѿ ѿ ѿ

Я Б В Г Д Е Ж З Н І  
 Ф Х ѿ Т Ц Ч Ш Щ Ъ Ы Ь Ъ

а б в г д е ж з н і  
 ф х ѿ т ц ч ш щ ѡ ѡ ѡ ѡ

а ф ѡ в х т ц б с в р  
 ш н л з ы л ш н ѡ к

а е н і о ѡ ѡ ѡ ѡ ѡ ѡ ѡ ѡ

в б г д ж з к л м н п р

з ѡ



З Н І К Л М Н О  
 ѿ Ц Ч Ш Щ Ъ Ы  
 ѿ ѿ ѿ ѿ ѿ ѿ

в а м н о п р е т оу ѡ  
 ю ѿ ѿ ѿ ѿ ѿ ѿ ѿ ѿ ѿ ѿ

**Do's and Don'ts:**

- do not assume anything about fonts and their OpenType features
- do not access the PUA

## Individual preferences and alternate solutions

- for texts of various geographic provenience
- for older or younger (medieval) texts
- for specific local orthographic traditions



modern  
char.

replace  
with

modern  
char.

alt  
layer

**Insight gained:**

**You can't please everybody all of the time.**

(Museum of Natural History  
in Struga, MK)



## What about deprecated characters?

*Background: Once added, no characters are ever deleted from UC; corrections possible.*

*Deprecated characters: entries no longer recommended for active use.*

*Not hidden from view; info available only in UC charts.*

(Museum of Natural History  
in Struga, MK)



### Deprecated letter

- 0149    'n    LATIN SMALL LETTER N PRECEDED BY APOSTROPHE  
= latin small letter apostrophe n (1.0)
- this character is deprecated and its use is strongly discouraged
  - Afrikaans
- ≈ 02BC' 006E n
- legacy compatibility character for ISO/IEC 6937
  - uppercase is 02BC' 004E N

(Museum of Natural History  
in Struga, MK)



**Fact:**

**No Cyrillic characters officially deprecated  
as of UC code charts v. 13, 2020**

# Questionable "characters"

0476	0477	0478	0479	047A	047B	047C	047D
Ÿ	ÿ	Oy	oy	Ō	ō	Ŭ	ŭ



early additions for OCS

## Cyrillic Extd C

1C80	1C81	1C82	1C83	1C84	1C85	1C86	1C87	1C88
Ѳ	Ѣ	Ѡ	Ѣ	Ѥ	Ѧ	Ѧ	Ѧ	Ѧ



"Variants rather than separate characters..."

Introduced for Synodal printing

2DF5
Ѣ



Superscript st:  
status unclear



**Two schools of thought:**

- "if it's available (via this kb driver) then users will be encouraged to actively use it"
- "who are we to decide what to consider deprecated and not give access to"

ad 1: because there are always alternate methods of inputting characters, users will find these characters anyway (if they know about them)

ad 2: except for obvious errors and mistakes in UC the general aim "to give access to all OCS characters" should be honored



**STOEWER  
RECORD**

**Competing solutions (regarding deprecated chars):**

- do not implement them at all in the KB driver
- at least do not feature them prominently

**No hard decision made**

**Result: single OCS kb driver feasible with 3 dead keys**

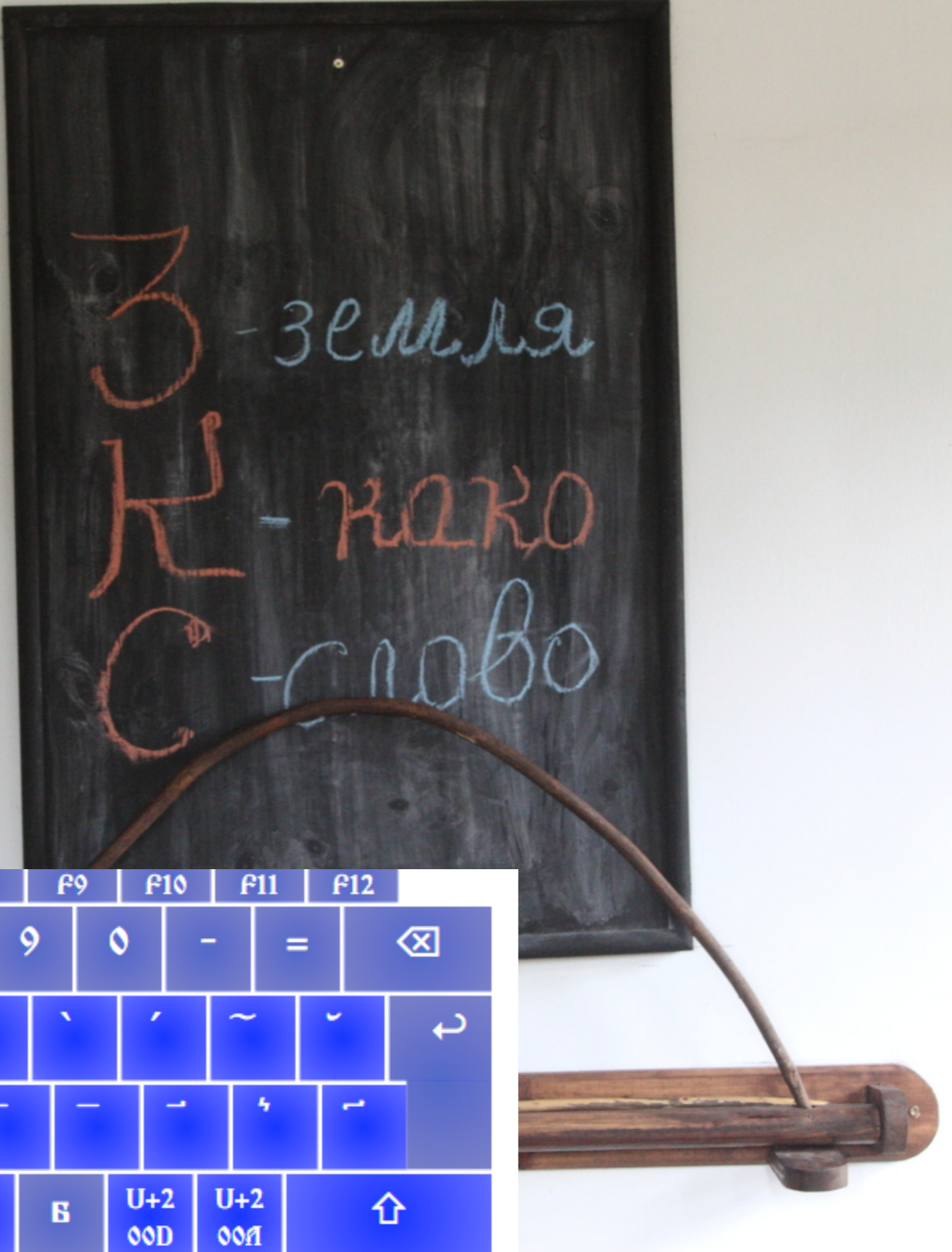
- one for superscripts ( <sup>B X</sup> )
- one for alternate/additional characters ( Ç Ø Ò Ó Ô )
- one for accents and titla ( ´ ` ¨ ¯ ˆ )



**(Tallinn, Old Town)**



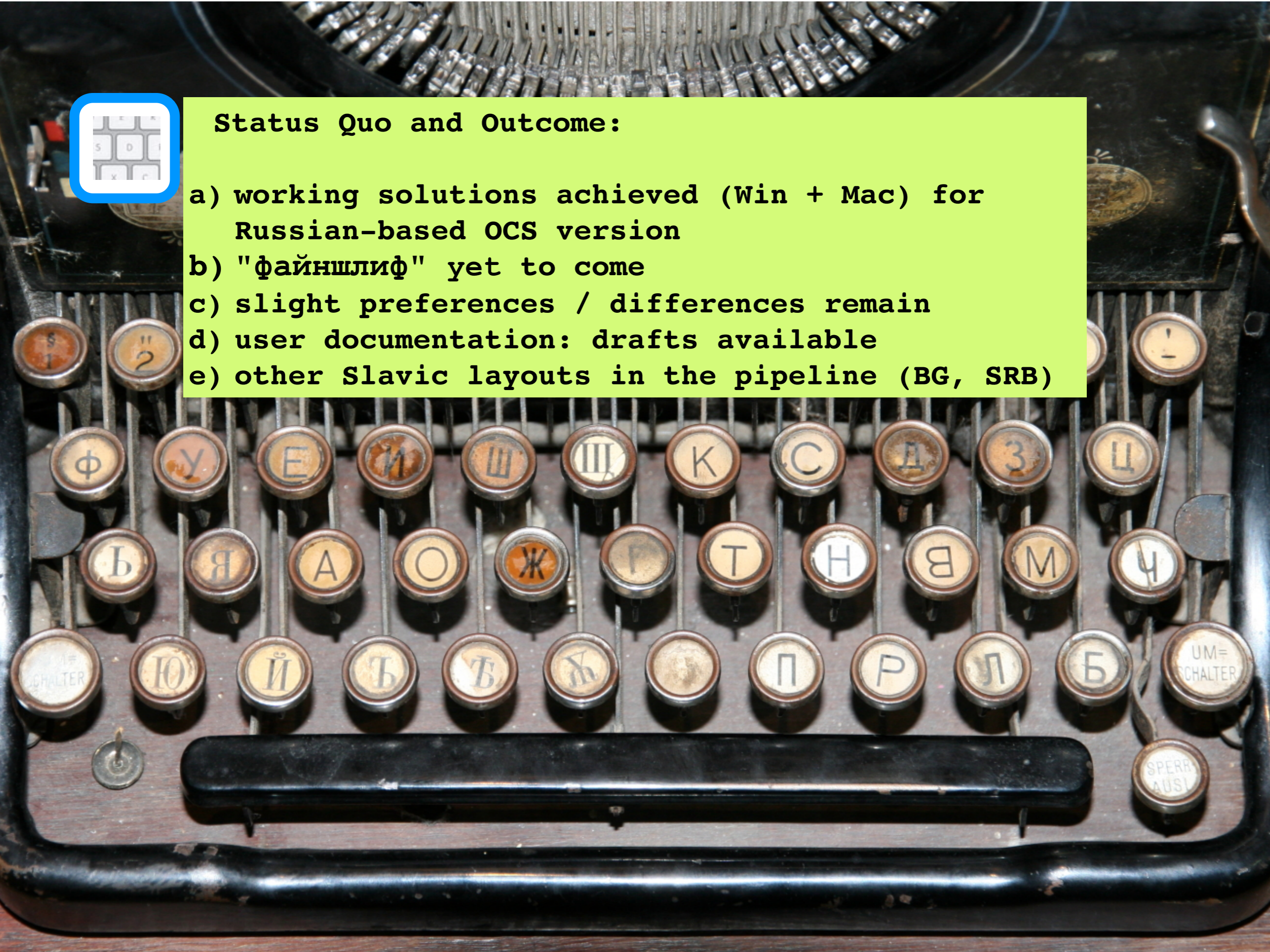
**Titla, combining  
halfmarks, vertical  
tilde, yerik, dots etc.:  
Need for documentation!**





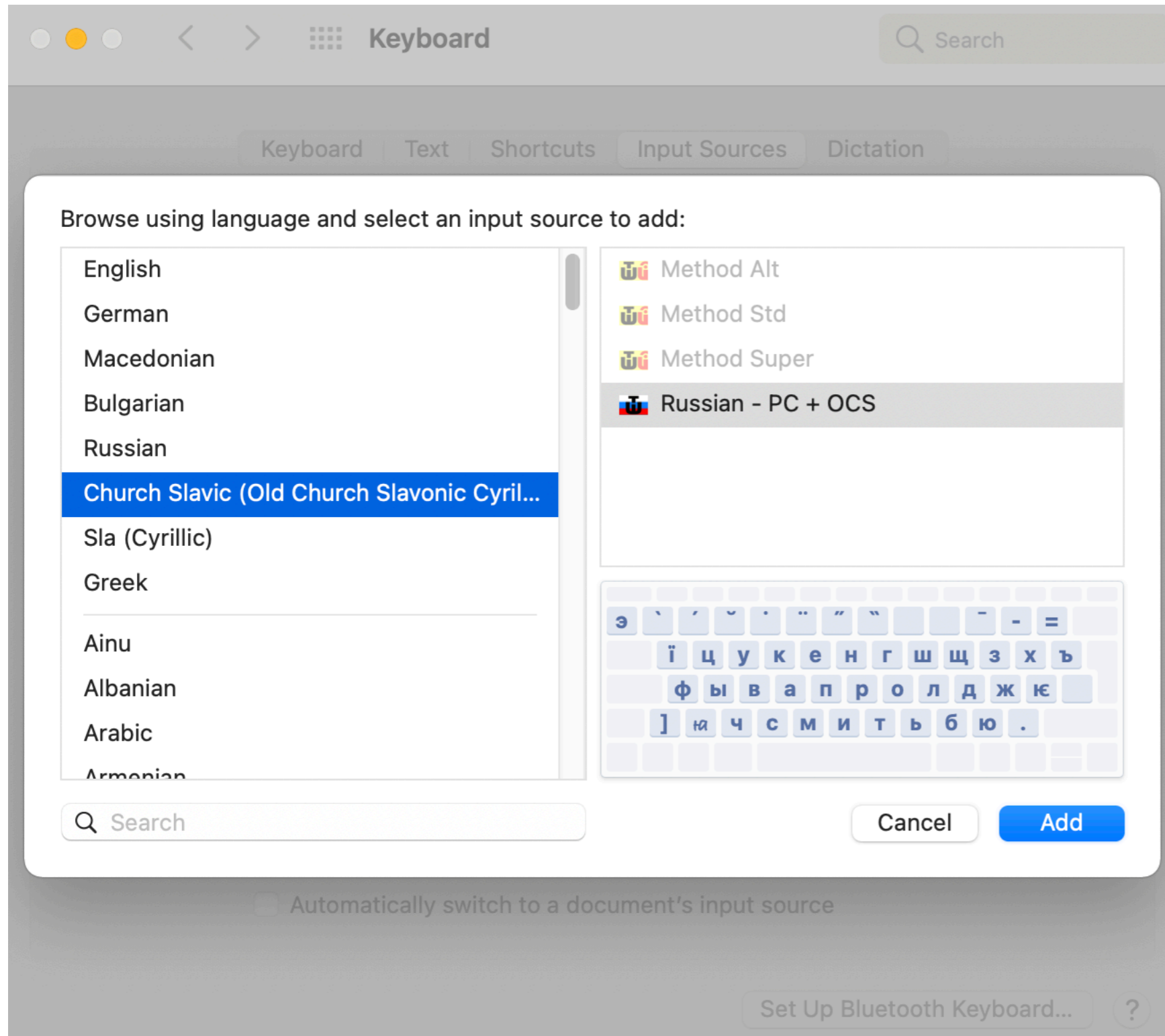
## Status Quo and Outcome:

- a) working solutions achieved (Win + Mac) for Russian-based OCS version
- b) "файншлиф" yet to come
- c) slight preferences / differences remain
- d) user documentation: drafts available
- e) other Slavic layouts in the pipeline (BG, SRB)

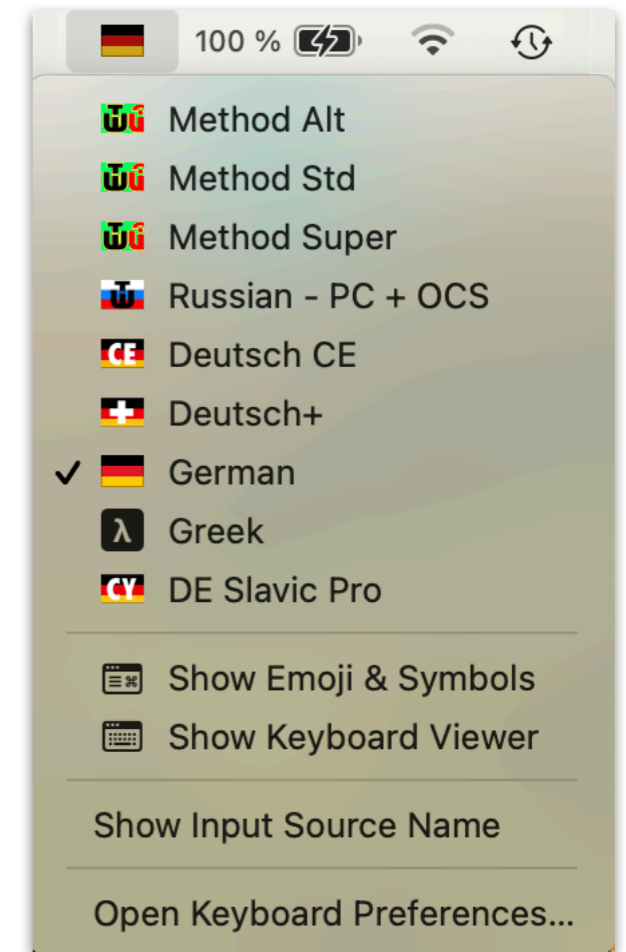




## Icon, Name and Script System for Sebastian's Mac keyboard driver



Installation



Keyboard Selection



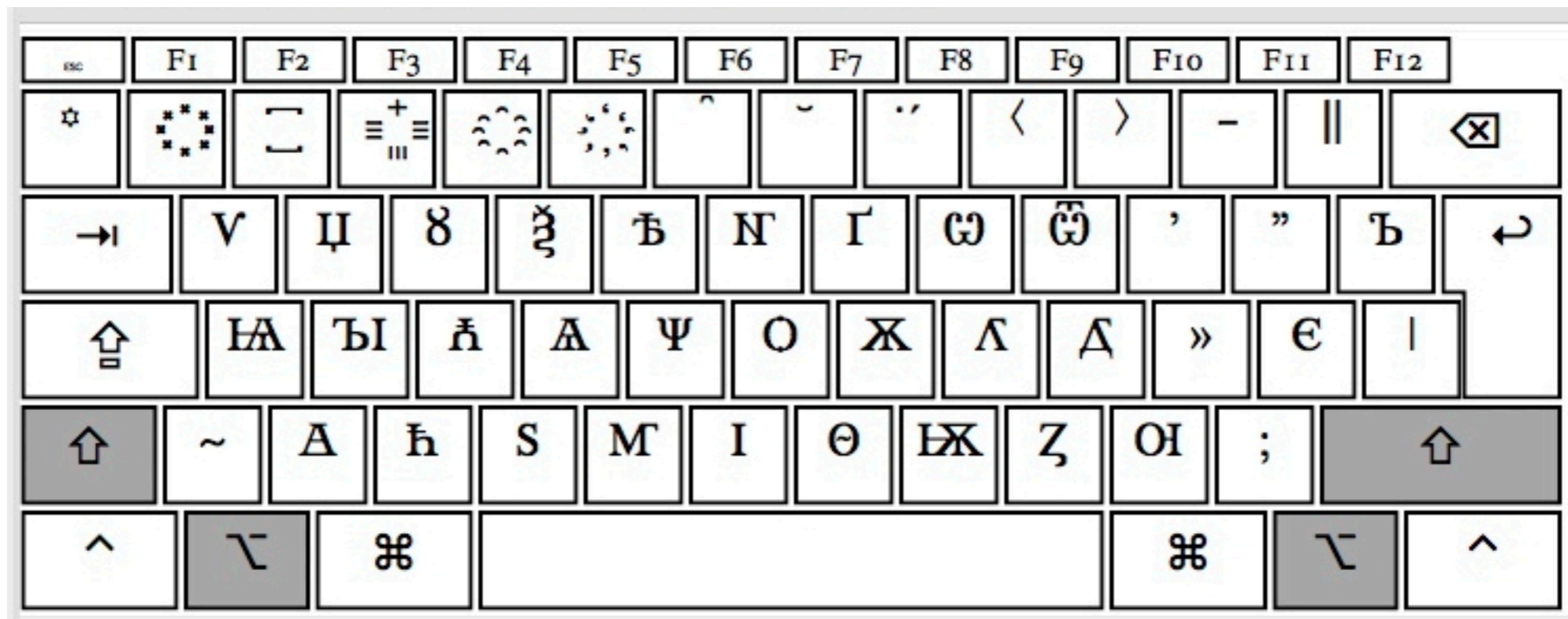
Icon



shift

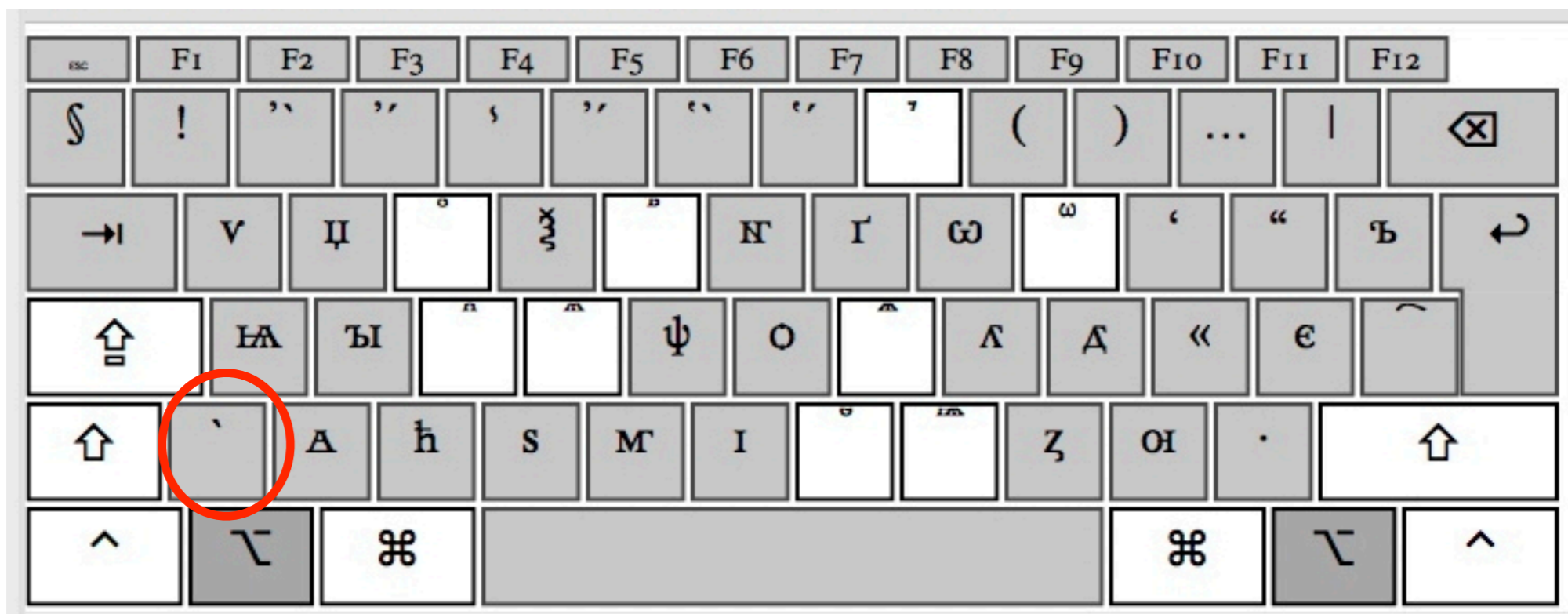
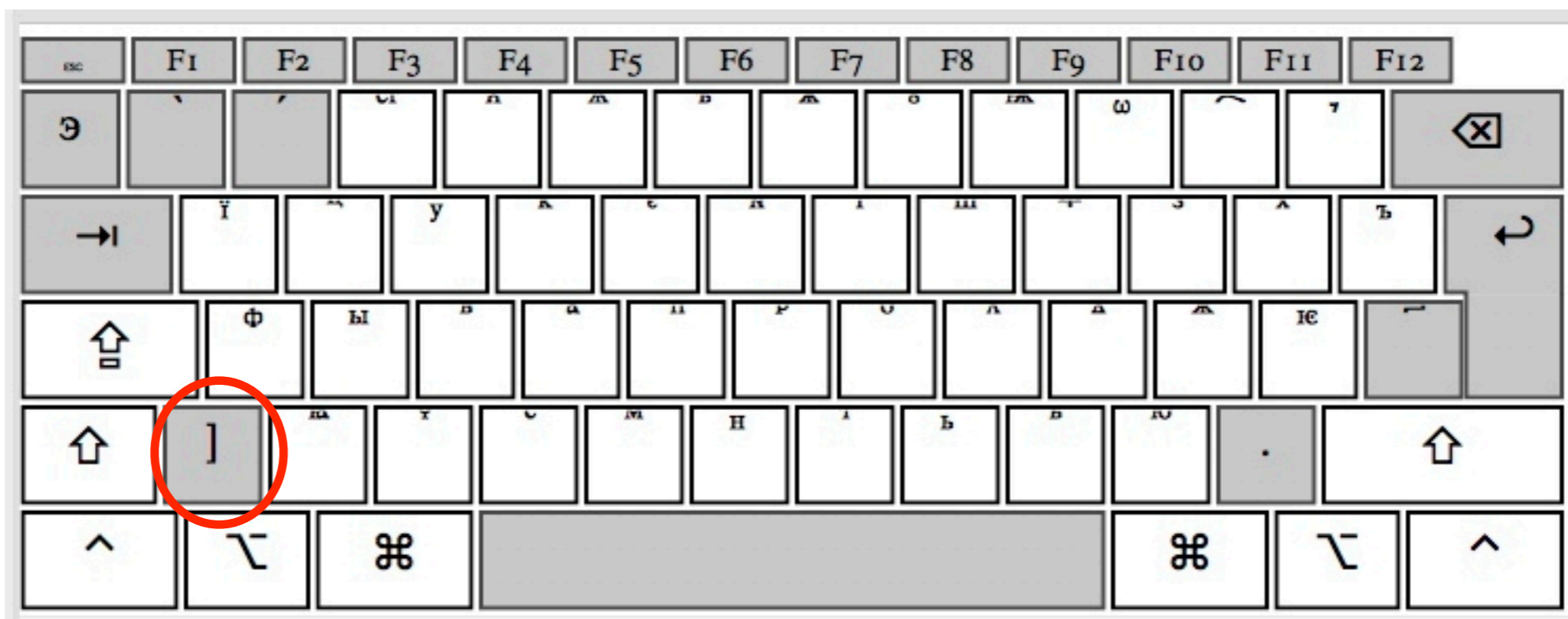


alt-shift

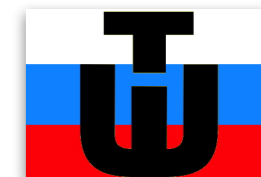


dead key 1: superscripts

= ` / ~ key on US kb (upper left corner; superscripts!)

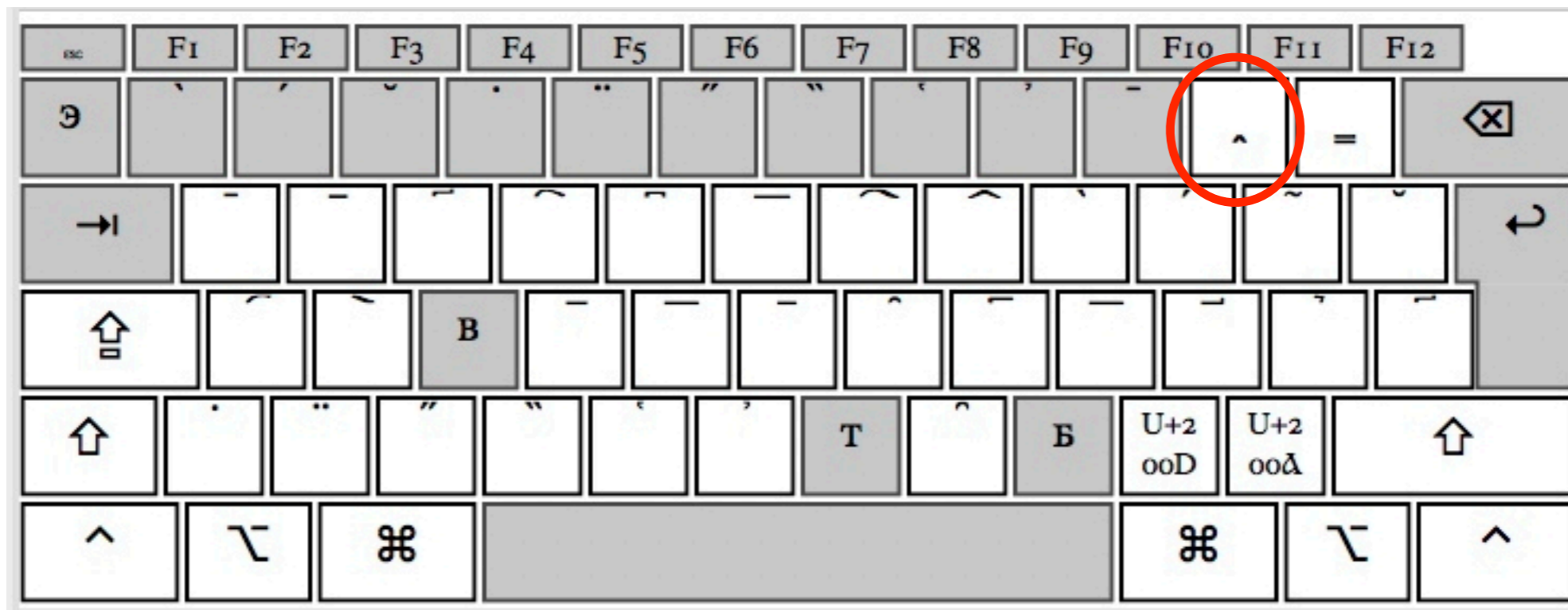


+ alt



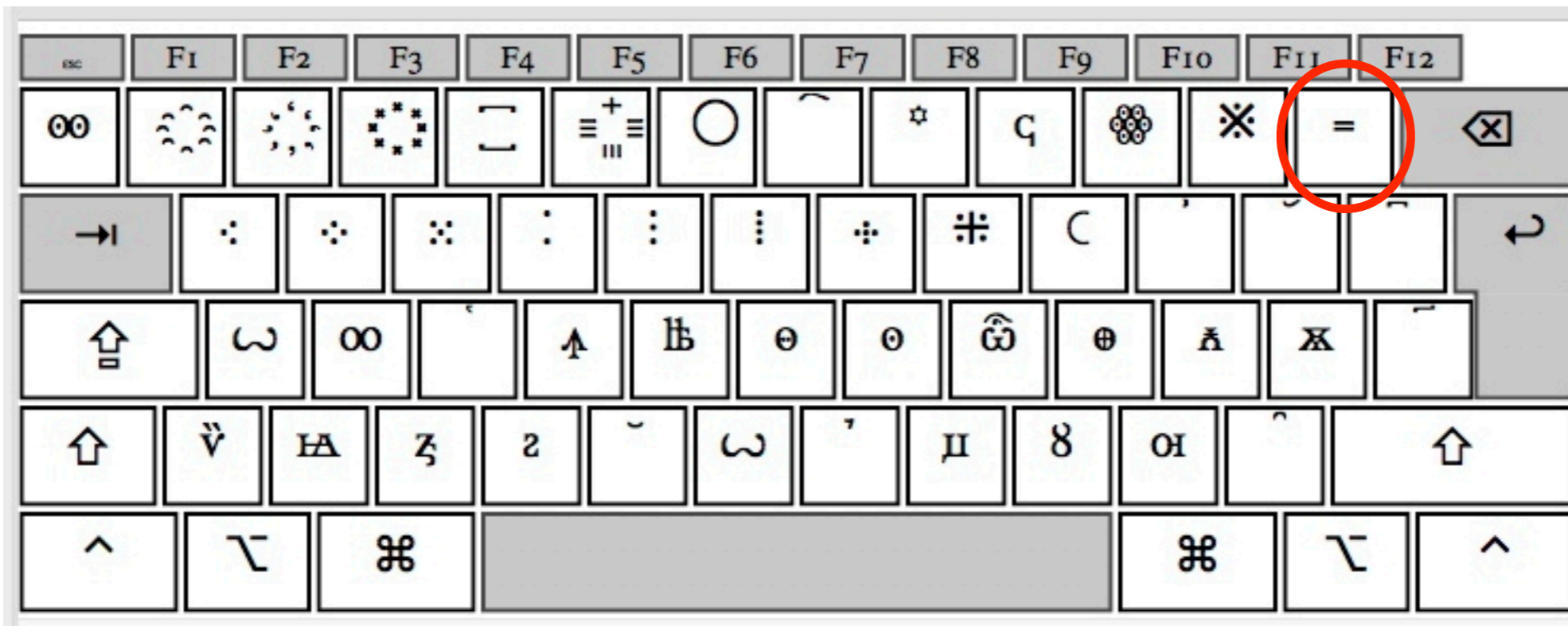
dead key 2: titla and co.

-: titla, overlines etc.



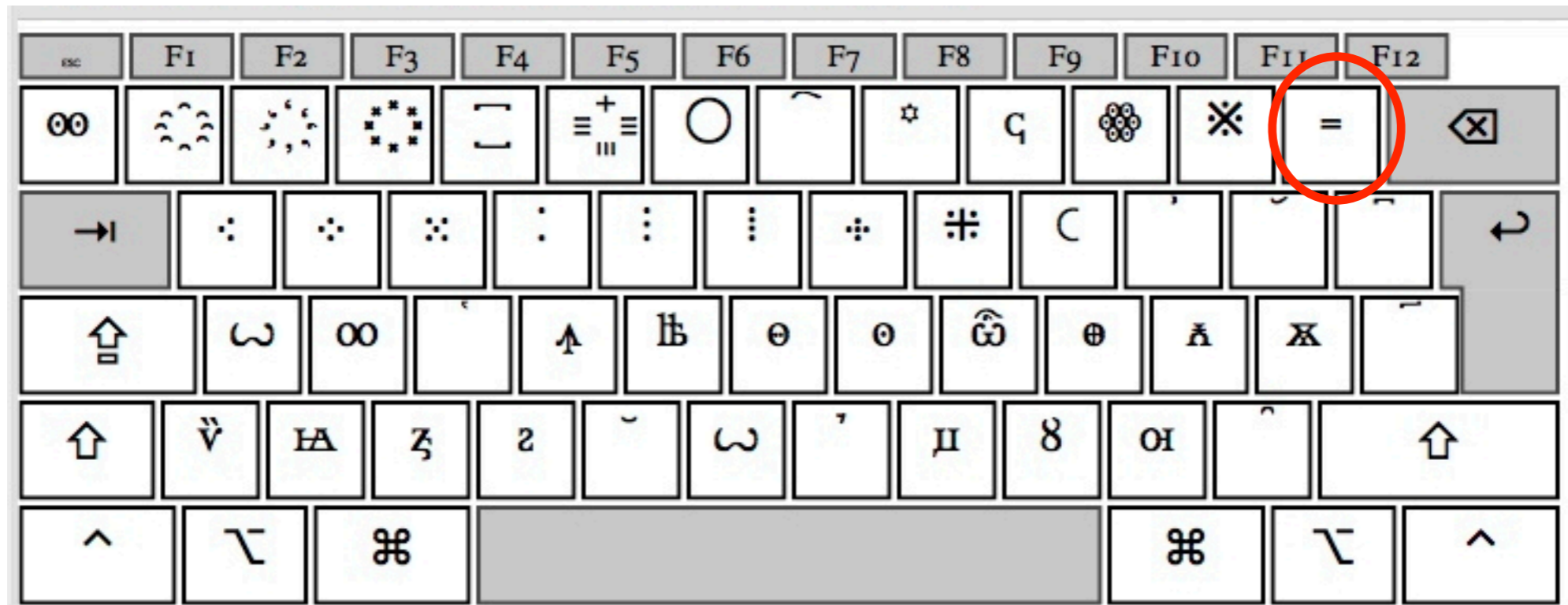
dead key 3: number signs, alternate characters

=: alternate chars.

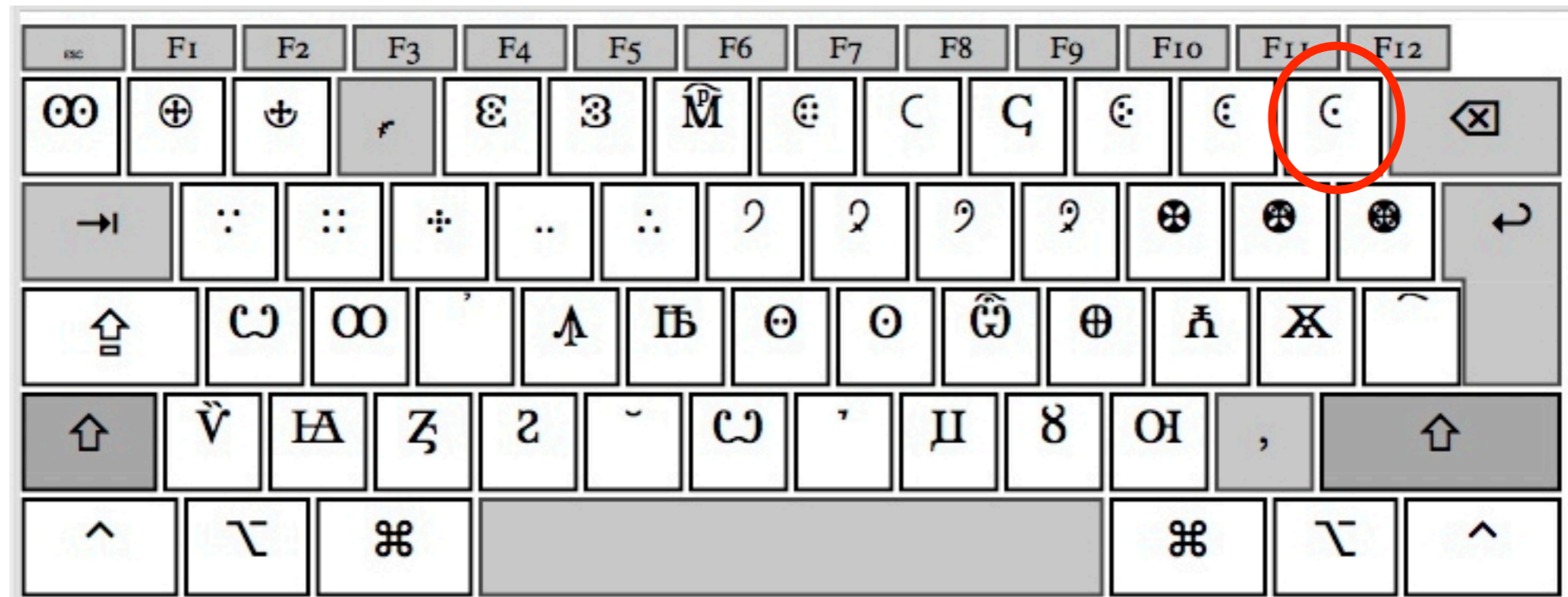


dead key 3: number signs, alternate characters

=: alternate chars.

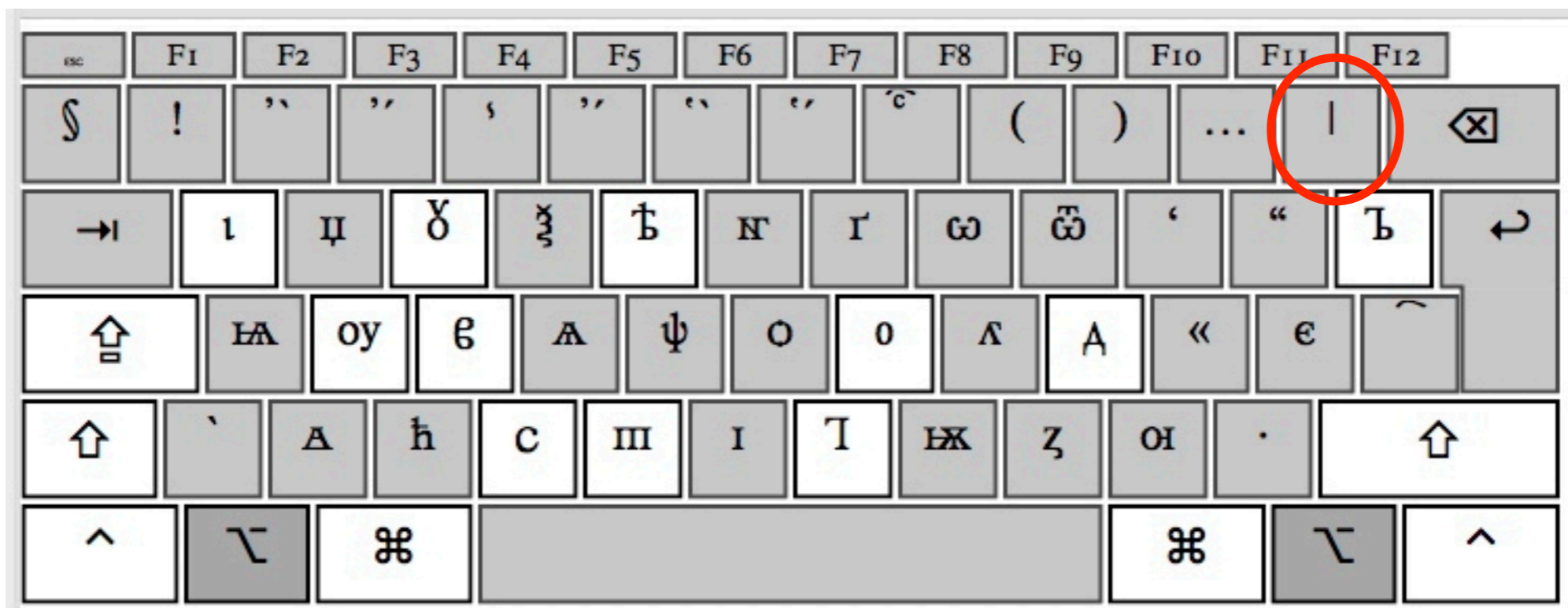
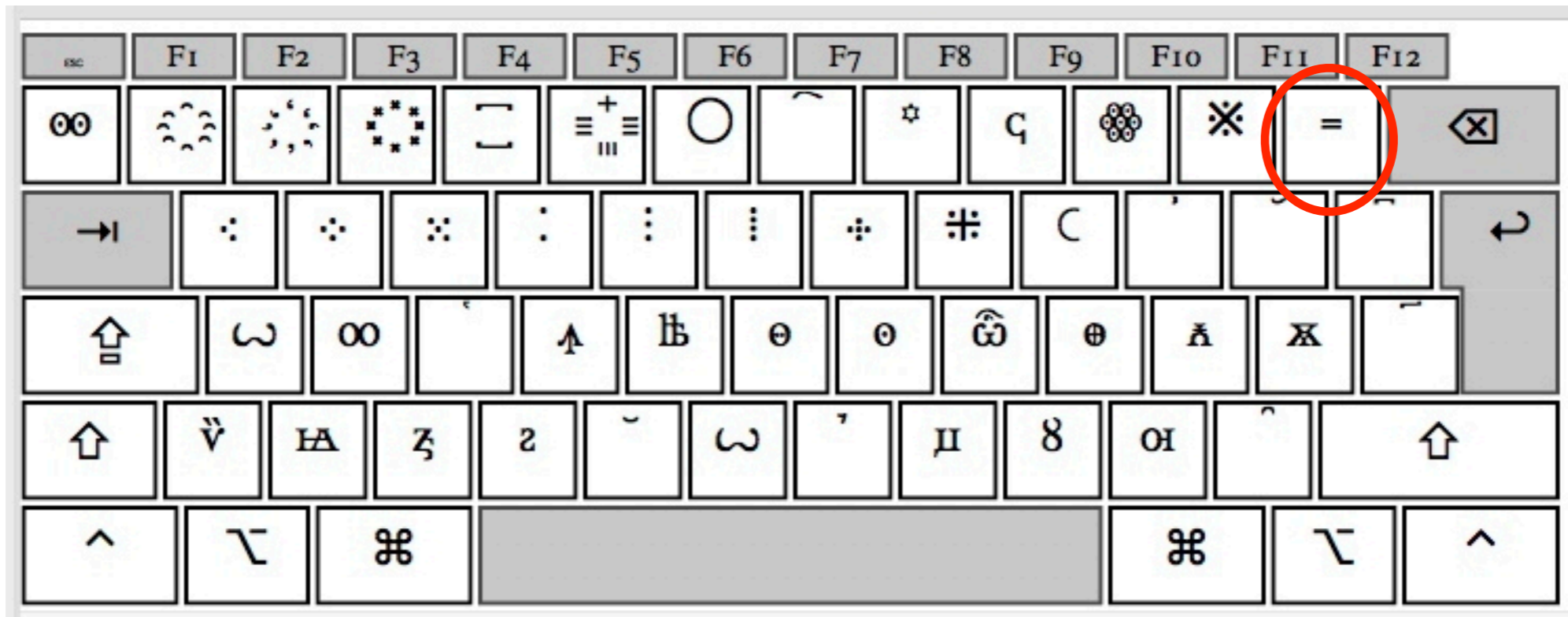


+ shift



# dead key 3: number signs, alternate characters

=: alternate chars.



+ alt





Download Mac driver here:

[https://kodeks.uni-bamberg.de/AKSL/Schrift/OCS-  
Keyboards.htm](https://kodeks.uni-bamberg.de/AKSL/Schrift/OCS-<br/>Keyboards.htm)





**Thank You!**



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