

Guide to Stolyarovian Shorthand

by Gennady Stolyarov II

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 I Gⁿdy SĀV II

System invented in 2003,

Made publicly available in 2013

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Table of Contents

Item	Page
History and Evolution of Stolyarovian Shorthand	3
Original Symbols of Stolyarovian Shorthand – Spring 2003	4
Vowel Superscripts	5
Phonetic Symbols	6
Consonant Middle-Scripts and Other Convenient Devices	7
Combination of Devices	9
Further Developments in Stolyarovian Shorthand	9
Shorthand Symbols for Common Numbers	10
General Principles of Stolyarovian Shorthand	11
A Non-Exhaustive Glossary of Symbols	12

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History and Evolution of Stolyarovian Shorthand

Stolyarovian Shorthand began in 2003 and has evolved gradually since. The best way to convey it to you, in such a manner as will enable you to understand it, is to introduce it along with the story of its piecewise development. The Glossary at the end of this guide offers a thorough (but by no means exhaustive) listing of symbols for Stolyarovian Shorthand in its present form. Use it as a reference whenever you find that it aids your understanding.

Stolyarovian Shorthand grew out of an environment institutionally hostile to advanced technology – high school. High school was – and I would not be surprised if it still is – a place where scribbling on paper is expected far more often than anywhere else in life. Note-taking from textbooks was particularly time-consuming. It was a largely pointless endeavor in my view, but one which was required (and graded for thoroughness) in many of my classes. Stolyarovian Shorthand was developed as an attempt to relieve note-taking of many of its burdens by achieving **(i)** symbol economy and **(ii)** speed of expression. In as few characters as possible and as little time as possible, I strived to capture as much information as possible while remaining able to read it with fluency.

Two individuals were crucial in motivating the development of Stolyarovian Shorthand, even though one of them clearly did this unintentionally. I will call them the Inspiring Business Teacher and the Demanding History Teacher. The Inspiring Business Teacher taught me for a year in 2002-2003 and truly loved his subject. His instruction was engaging, and his enthusiasm was contagious. He also acknowledged his students' creativity and rewarded it. (I later nominated him for Teacher of the Year.)

He encouraged his students to consider the contributions of entrepreneurs (~~✂~~) and the mindset that motivated those contributions. His lectures were, in fact, worth taking notes on, but I experienced the persistent difficulty of my pen lagging behind his words.

One day I decided to try to conserve the number of strokes I needed to record the essence of his thoughts. Because the notes were for my own use, I did not have to concern myself with the proper English spelling of each word. Rather, I was inspired by the elegance of the “at” symbol: @. @ is widely accepted, as is & (or §, as more commonly used in handwriting) – but there are few other such symbols, despite the essential similarity of many prepositions and conjunctions that could really use them. These words (but, by, of, or, over, through, and many others) were used so often that considerable time savings could be achieved if each of them were replaced by a single character. The same could be done for commonly used pronouns (who, what, that), verbs (is, are, was, were) and terms that were ubiquitous in numerous academic contexts (true, false).

In the spring of 2003, I developed the first list of Stolyarovian Shorthand symbols, all of which could fit into a table on a single page. On the next page are many of the symbols from that first batch.

Original Symbols of Stolyarovian Shorthand – Spring 2003

about	
as	
after	
among	
are	
before	
between	
but	
by	
false	
for	
from	
how	
in	
is	

of	
on	
or	
over	
that	
through	
to	
under	
was	
were	
what	
who	
why	
will be (singular)	
will be (plural)	

At first, I introduced the shorthand quietly into my own notes and indeed found the hoped-for gain in speed without loss of substance. However, some of my classmates, when glancing at my notes, found that the symbols were indecipherable to them. Perplexed, they asked me what these characters were during the five-minute break prior to the start of class. I briefly explained the essence of my project and drew a few symbols on the whiteboard. When the Inspiring Business Teacher heard my explanation, he exclaimed, “*This* is how great entrepreneurship begins – with simple ideas that change the way things are done!” Encouraged by this, I decided to systematize Stolyarovian Shorthand and to make it available to others – for a price. My production technology was rather primitive: I created tables in Microsoft Word, with full words for each symbol typed out on the left side. I then printed the tables and hand-wrote the symbols on the right side (I did not have access to a photocopier). I produced perhaps fifteen

of these first-generation guides and charged \$2 apiece to fellow classmates who wanted to gain an edge in their note-taking.

It was technically against school rules for students to sell anything on school grounds (a powerful anti-commercial bias prevailed outside the business classroom), and I had already gotten into trouble with the administration the previous year for selling makeshift German-English dictionaries that emphasized the vocabulary taught in German class. This time, my black-market sales of shorthand guides were executed more prudently. I made an effort to conduct the actual transactions outside school grounds – including at math competitions in other schools, where some fellow math team members showed interest in my explanation and in the product. My proceeds from this endeavor were perhaps \$30 in total – nothing to scoff at for a high-school student who did not get an allowance. I eventually ended up donating this money, and quite a bit more, to the [Methuselah Foundation](#), to support research on mouse (and eventually human!) life extension.

I will never forget the Inspiring Business Teacher, whose influence has helped Stolyarovian Shorthand to expand and now to be propelled to the next stage. While I do not plan to commercialize my system, I am setting it free online so that other users might derive the same efficiency gains that I did. This is a different form of entrepreneurship, but it still fundamentally relies on spreading ideas that change the world by working to users' individual advantages.

In the fall of 2003, I received another unexpected motive to develop Stolyarovian Shorthand. This time the incentive was negative rather than positive – an external pressure that pushed me to become even more efficient, or else risk devoting considerably more time than I had to homework.

The Demanding History Teacher taught Advanced Placement U.S. History. He was a notoriously stringent grader with exacting expectations on homework and projects. He also assigned students approximately 30 pages of textbook reading per night – with the expectation of detailed note-taking that, in practice, amounted to transcribing the textbook by hand. He banned the use of any electronic devices for note-taking, but he did tell the class that abbreviations were allowed, as long as we were able to understand them. So I took him at his word.

I realized that, if I wished to avoid filling 30 notebook pages every night, I needed to achieve *radical* symbol economy, which could not be done solely through a small set of special characters. Virtually every word would need to be condensed about twofold in order for me to avoid losing sleep every night.

Vowel Superscripts

My first technique to conserve symbols (and strokes) was to replace most vowels with superscripts above the succeeding consonant.

An “a” before a consonant became an angular “hat” above the consonant. For instance, “al” became \hat{l} .

An “e” before a consonant became a horizontal line above the consonant. For instance, “el” became \bar{l} .

An “i” before a consonant became a small circle above the consonant. For instance, “il” became $\overset{\circ}{i}$.

An “o” before a consonant became an arc above the consonant. For instance, “ol” became $\overset{\frown}{o}$.

A “u” before a consonant became a sideways rightward-expanding angle above that consonant. (This superscript took some time to refine, but several months of experimentation led me to conclude that it is the most effective way to conserve strokes, among remaining options.) For instance, “ul” became $\overset{\nearrow}{u}$.

A “y” before a consonant became an inverted arc above the consonant. For instance, “yl” became $\overset{\smile}{y}$.

The vowel superscripts could be used in conjunction with the word-specific symbols I developed earlier. For instance, “eon” could be written as $\overset{\circ}{e}$, and “ion” could be written as $\overset{\circ}{i}$.

Phonetic Symbols

The English language has a dearth of letters, as compared to the sounds that are possible. In addition, some sounds are needlessly represented by multiple letters (as in “ph”, “qu”, and the silent “e” at the end of certain words). To further conserve space and strokes, I developed phonetic symbols for common consonant and vowel sounds. A few of these were borrowed from German, and some were decisions to simply use fewer English letters, but most were original.

Here they are:

ae	\ddot{a}	ou, ow (as in “without”, “loud”, “allow”)	b
au, aw (as in “August”, “hawk”)	d	ough, uf (as in “rough”, “tough”, “gruff”)	f
ch	€	ow (as in “grow”, “tow”)	w
ee, ea (as in “need”, “each”)	e	qu	q
ia (as in “menial”, “trriage”)	\wedge	sh	sh
ie, igh, eye (as in “might”, “right”, “lie”, “eye”, “pride”)	y	th	t
ph	f	wh	wh
oi, oy (as in “noise”, “toy”)	ö	you (as in “use”)	ü

The introduction of phonetic symbols made possible the further condensation of letters. For instance, “oth” could be expressed as t , and “ish” could be expressed as sh . In addition, I removed the silent

“e” from words where it made no phonetic difference – e.g. “motive”, “salve”. The “ive” combination in such cases was expressed simply as \check{v} . Where the silent “e” did matter, as in “hide” or “gave”, I replaced the vowel sound (e.g., “h \check{d} ”, “gäv”).

It was in this form that the Demanding History Teacher saw my notes during his routine check of all students’ notebooks to determine whether the note-taking was thorough enough (\check{t} \check{e} \check{w} \check{n} \check{f}).

As this was quite outside his model of expected student behavior, he was skeptical of the notes’ substance. So he pointed to a random passage on a page and asked me to read it out, which I promptly did with the same fluency as I had with ordinary written English. He grudgingly told me that he would give me an A for my notes, *this time*, but he expected them to be more conventional in the future. While he would accept some abbreviations, he wanted to be able to personally ascertain the notes’ content at a glance. I negotiated with him that I would write out all the section titles in full English and would use mostly conventional English characters – *but* I would still be allowed to use a few of the more recognizable special symbols for stand-alone words, and would also be able to omit vowels where the meaning could still be discernible (writing “srvnts” in place of “servants”). Over the course of several months, I gradually and subtly escalated my use of shorthand, “easing” the Demanding History Teacher into tolerating it. Most of my other teachers were nowhere as particular about the format of notes, and those that required class or textbook notes accepted either shorthand or typed notes, or both. Thus, the cumulative time savings for me was enormous, during an immensely burdensome junior year of high school where I needed every efficiency-improving tool I could use. I partially credit Stolyarovian Shorthand with preserving my physical and mental well-being during that time.




Consonant Middle-Scripts and Other Convenient Devices




In the meantime, I continued to refine Stolyarovian Shorthand. To achieve even further symbol economy, I developed a convention to express combinations of multiple consonants in a single symbol. Each subsequent consonant would modify the symbol of the first consonant in the sequence. The modification can be called neither a superscript nor a subscript, so I called it a “middle-script”. The middle-scripts were developed only to account for some of the most common subsequent consonants, so it is still possible to have combinations of consonants that must be written out.


Because of the different position of the middle-scripts on a symbol, I was able to reuse some of the same stroke types as were used for the vowel superscripts.

A “c” or “k” after a letter became a downward-oriented right angle through that letter. For instance, “lk” became \check{t} .


A “d” after a letter became an upward diagonal slash through that letter. For instance “ld” became \check{t} . (This would later also become the symbol for “lead” – an example of how context can enable multiple uses of the same symbol in Stolyarovian Shorthand.)


A “g” after a letter became, in most cases, an extension of that letter, consisting of a vertical line and a smaller upward diagonal line at its bottom. For instance, “lg” became , and “ng” (the most commonly used combination of this sort) became . There are some exceptions to this rule, where its application would result in characters that resemble others too much. For instance, “rg” is instead written as , with the curled tail, to prevent confusion with “ng”.


An “h” after a letter became a sideways rightward-expanding angle through that letter. For instance, “lh” became . This is the logical extrapolation of single-sound symbols I developed, such as  and .



An “m” after a letter became a curl attached to the end of that letter. For instance, “lm” became .

A “p” after a letter became a downward diagonal slash through that letter. For instance “lp” became .



An “r” after a letter became a sideways leftward-expanding angle through that letter. For instance, “lr” became .

An “s” after a letter became an arc under that letter. For instance, “ls” became .

A “t” after a letter became a horizontal line through that letter. For instance, “lt” became . (This would later also become the symbol for “let”.)

Of course, the middle-scripts could be used not just with consonants, but with the special symbols – both word symbols and phonetic symbols. As a result, “overt” could be written as , and “aim” could be written as .

In addition to the middle-scripts, another device enables the avoidance of writing consecutive consonants. Inspired by mathematical exponential notation of variables (where $xx = x^2$), I introduced the same convention into Stolyarovian Shorthand.

One syllable – ent – was sufficiently common in the English language that I decided to introduce a special symbol for it: . Using the middle-script for “r”, one can write “entr” or “enter” as . (Again, context will determine whether the symbol denotes a part of a word or an entire word. As there is no stand-alone word “entr”, I saw fit to reuse the symbol for “enter”.) For another common syllable, “ate”, I simply used the number 8.

Combination of Devices

But the biggest payoff from Stolyarovian Shorthand came through the combination of devices to develop symbols into which entire large words could collapse.

First, it should become apparent that the vowel superscripts and consonant middle-scripts can be used on the same symbol. For instance, “act” can be written as \hat{c} , and “else” can be written as \bar{l} (the “e” at the end does not matter; after all, what *else* could that stand-alone symbol be?).

But multiple middle-scripts could also be combined on the same letter, as long as the symbol for that letter allowed this without too much clutter. The general convention is that the higher middle-scripts denote earlier consonants. For instance, “order” can be written as \mathcal{O} (“ordr”), and “armed” can be written as \mathcal{A} (“armd”). There are some exceptions, as when the “m” curl and another middle-script are used in the same symbol but the “m” curl appears below. There is still a strong presumption that the “m” comes first, unless the curl of the “m” is on the other consonant’s superscript. For instance, \mathcal{F} is read as “formed”, not “fordm”. On the other hand, \mathcal{B} is “become” (“bkm”, which is phonetically equivalent to “bcm”).

The “squaring” convention can also be used in a combination symbol, with the caveat that it can apply only to the main letter, not to a “scripted” letter. For instance, “add” can be written as \mathcal{D}^2 , and “utter” can be written as \mathcal{T}^2 . If a special symbol is based on a consonant, it is possible to use the “squaring” convention to add one more of this consonant. For instance, “off” can be written as \mathcal{F}^2 , and “offer” can be written as \mathcal{F}^3 (“offr”).

Now it is possible to show the potential of this notation in expressing extremely large words with incredible conciseness. Consider “endpoint”, which can be abbreviated as “endpt” and then written as \mathcal{N} . Other words which collapse into one symbol include “accepted” (\mathcal{A} - “accptd”), “attempted” (\mathcal{T} - “attmptd”), equipment (\mathcal{E} - “eqpt”), and – to return to that symbol from the beginning – “entrepreneurs” (\mathcal{E} - “entrps”).

Further Developments in Stolyarovian Shorthand

I continued to utilize Stolyarovian Shorthand through the end of high school, the entirety of college, and beyond. As my proficiency grew, I was able to transcribe the content of entire lectures of professors – such that my notes enabled me to capture the whole of what would be tested or used as the basis for assignments. I expanded the special symbols of the shorthand based on the subjects I studied, to enable even quicker recording of common terms. In addition to adopting common mathematical notation (“for

all" - \forall , "there exist(s)" - \exists , "therefore" - \therefore , and "change" - Δ), I developed new symbols for mathematics ("difference" - δ , "distribution" - ∂ , "function" - f , "given" - $-c$, "prime" - $\#$), economics ("competition" - ς , "consumer" - ξ , "cost" - \cup , "monopoly" - \mathbb{M} , "profit" - $\#$, "utility" - ρ), and history/philosophy/political science ("existence" - Σ , "government" - ρ , "individualism" - $\#$, "king" - \mathbb{M} , "man" - ρ , "quality" - \mathbb{Q} , "war" - \times).

In addition, I made more creative use of the common mathematical symbol for "not" (\neg) as a middle-script of verbs. For instance, "are" ($\#$) was combined with this symbol to become "are not" ($\#\neg$).

Likewise, "can" (\cap) in combination with this symbol becomes "cannot" ($\cap\neg$). The same symbol could be used as a superscript over the first letter "x" of any word to denote "not x" (\bar{x}).

I also developed superscripts to serve in place of the stand-alone symbols "to" (\supset) and "from" (\supsetleftarrow), but resembling those symbols. "To x" (where "x" is the first letter of any word) can be written as \bar{x} . "From x" can be written as \bar{x} .

Shorthand Symbols for Common Numbers

Numbers with two or more digits can be condensed using Stolyarovian Shorthand and the middle-scripts previously developed. I devised this approach in 2010, when I sought to find an approach to express the present year in as few characters as possible. I have always disliked the "cutting off" of the foremost two digits of the year, and have generally refused to engage in it, because I will not confine my perspective to the present century. Thus, I sought a way to preserve the information regarding the century. I also wanted a more convenient way to record statistics expressed as approximate large numbers (e.g., whole thousands and millions).

When combined with the middle-script for "t", a number is multiplied by ten. For instance, 20 can be expressed as $\overset{2}{z}$.

When combined with the middle-script for "h", a number is multiplied by one hundred. For instance, 200 can be expressed as $\overset{2}{z}$.

When combined with the middle-script for "k", a number is multiplied by one thousand. For instance, 2000 can be expressed as $\overset{2}{z}$.

When combined with the middle-script for "m", a number is multiplied by one million. For instance, 2,000,000 can be expressed as $\overset{2}{z}$.

As with the combination of middle-scripts to represent successions of consonants, middle-scripts can be combined on a number, with the higher middle-script denoting the priority. For instance, the year I wanted to express, 2010, can be written as $\frac{2}{10}$. (The “2000” comes first, and then the “10” is added.)

On the other hand, 20,000 can be written $\frac{2}{000}$. (The “20” comes first, of which the “k” middle-script takes one thousand). Multiplication of the second middle-script by the first is only done when the second middle-script is of a higher denomination than the first; otherwise, the second middle-script adds a multiple of ten in a decimal position smaller than that of the first middle-script.

This notation is useful only in situations where one or more zeros exist in a number. Otherwise, writing out the whole number is unavoidable. But, in the present century, this approach can recommend itself at least for the expression of years.

General Principles of Stolyarovian Shorthand

Now that I have provided a glimpse into the history and workings of Stolyarovian Shorthand, it is time to express some general principles of this system.

1. Stolyarovian Shorthand is a product of consciously directed evolution, and has emergent attributes and inexhaustible symbols. While I introduced many “ad hoc” elements in the form of special symbols, the general conventions (e.g., superscripts, middle-scripts, squaring) makes possible the emergence of many symbols that were not explicitly designed. These are beneficial byproducts, all of which it is impossible to enumerate. As new words enter the English language, Stolyarovian Shorthand will facilitate their more concise expression in note-taking. The Glossary at the end of this guide contains many symbols, but they are just a sample. If you use Stolyarovian Shorthand to any great extent, you will certainly come upon many more characters, and perhaps even develop your own.

2. There are multiple ways to express any word, and there is no exclusive “correct” way. In note-taking, the desirable approach is dictated by convenience, not convention. Even looking at the Glossary, you will see that multiple symbols are possible for some combinations of sounds, and, in other cases, multiple combinations of letters can be denoted by a single symbol. Sometimes one has a choice between using a special symbol and a symbol that emerges as a result of the application of the general rules. Context will often determine how a particular symbol is interpreted, but this is fine – as the quality of notes is ultimately determined by your ability to read them. Whichever way of writing a word will save you strokes and space, while maximizing your understanding, is the way you should pursue.

3. Symbols can be formed from abbreviations and contractions of words, as long as the meaning is clear. As with “*srvnts*” and “*acptd*”, there are many shortened letter combinations that are only able to stand for one particular word each. Even if the whole English word might not collapse into a single Stolyarovian Shorthand symbol, a shortened version might. Remember, also, that combining shorthand with abbreviations is a decent idea for achieving even greater symbol economy.

4. Do not give in to the drudgery of busy-work, but strive boldly to use your intellect to overcome it. You will win time for more fruitful endeavors, Demanding History Teachers notwithstanding.

A Non-Exhaustive Glossary of Symbols

20	Ʒ
200	Ʒ
2000	Ʒ
2010	Ʒ
20,000	Ʒ
2 million = 2,000,000	Ʒ
about	Ʒ
ac	Ʒ
acc	Ʒ
accept	Ʒ
accepted	Ʒ
account	Ʒ
act	Ʒ
acts	Ʒ
ad	Ʒ
add	Ʒ
added	Ʒ
advantage	Ʒ
ae	ä
after	Ʒ
afterward	Ʒ

ag	Ʒ
age	äy
agg	Ʒ ²
aim	ä
aimed	ä
aims	ä
al	Ʒ
all	Ʒ
alm	Ʒ
am	Ʒ
amendment	Ʒ
among	Ʒ
amt	Ʒ
amount	Ʒ
an	Ʒ
ance	Ʒ
and	Ʒ
ang	Ʒ
anger	Ʒ
ans	Ʒ
ant	Ʒ

ap	\hat{p}
app	\hat{p}^2
appoint	\hat{p}^2
apr	\hat{p}
apt	\hat{p}
ar	\hat{r}
arc	\hat{r}
ard	\hat{r}
are	\parallel
are not	$\#$
area	α
argument	η
arithmetic	\hat{r}
arm	\hat{r}
armed	\hat{r}
ars	\hat{r}
art	γ
arter	γ
as	\odot
ask	\hat{S}
at	@
ate	\ddot{a} or 8

attack	\hat{t}
attempt	\hat{t}
attempted	\hat{t}
au, aw (as in "August", "hawk")	δ
average	\hat{v}
back	b
bad	B
be	\rightarrow
because	b_1
become	b_b
before	B
better	b
between	\Leftrightarrow
bond	B
but	δ
buyer	\ddagger
buy	\ddagger
by	\ddagger
can	\cup
can be	\cup
cannot	\cup
cannot be	\cup

ch	€
change	Δ
changed	Δ/
choice	Ɔ
choose	Ɔ
come	Ⓒ
competition	Ⓒ
complex	Ⓒ
conclusion	Ⓒ
constant	Ⓒ
consume	Ⓒ
consumer	Ⓒ
continuous	Ⓒ
cost)
ct	€
curve	Ⓒ
demand	Ⓒ
difference	Ⓒ
different	Ⓒ
differentiable	Ⓒ
distribution	Ⓒ
Doctor	Ⓒ























dr	Ⓒ
during	Ⓒ
ear	Ⓒ
eat	Ⓒ
eate	Ⓒ
econ	Ⓒ
ect	Ⓒ
edge	Ⓒ
ee, ea (as in “need”, “each”)	Ⓒ
e.g.	Ⓒ
eg	Ⓒ
egg	Ⓒ ²
el	Ⓒ
elastic	Ⓒ
element	Ⓒ
elm	Ⓒ
els	Ⓒ
else	Ⓒ
empt	Ⓒ
ence	Ⓒ
end	Ⓒ
ended	Ⓒ























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


















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


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










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

















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



















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