The Michela system



Description of Michela System

How are syllables written with the Michela phonetic keyboard?

Each syllable is composed of a set of sounds (phonemes), that Antonio Michela-Zucco, the Michela machine's inventor, classified into four phonic elements called "Serie" (series/banks):

I phonic element (initial sounds)

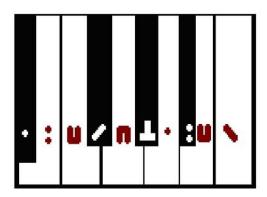
II phonic element (subsequent sound)

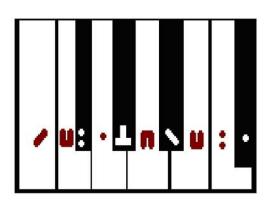
III main phonic element (tonic vowel)

IV phonic element (ending sounds).

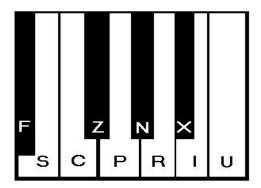
The phonetic writing

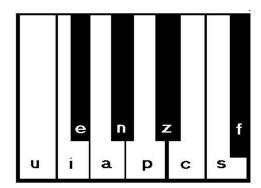
The Michela keyboard is formed by two distinct parts of 10 keys, one for the left hand and the other for the right hand (each finger has two specific keys assigned and can push only those). The original keyboard used six simple graphic signs to identify keyboard keys:





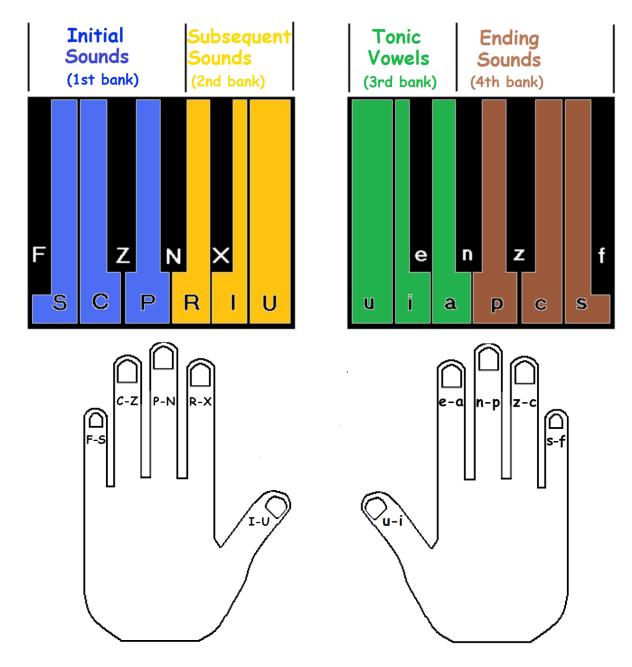
Then, in 1990, with the advent of of computer assisted transcription (CAT) systems, the graphic signs have been replaced by alphabetical letters:





With the Michela keyboard is first possible to write phonetically the syllables of any language, as if they were piano chords. In this mode (now only used for educational purposes) it records the sound of the spoken word like an audio recorder, but in writing. In this mode, each simultaneous pressing of one or more keys by the fingers of both hands corresponds to the sound of a syllable.

For example the syllable "SI" is made by the initial sound "S" and the main vowel sound "I", while the syllable "TRAT" consists of the initial sound "T", the subsequent sound "R", the tonic/main vowel sound "A" and the ending sound "T". As said, Michela machine repeats this structuring of the syllable and so its keyboard is ideally divided into four areas, called "serie" (series/banks), corresponding to the four parts in which each syllable can be ideally divided. The keyboard is then formed by two distinct parts of 10 keys, one for the left hand and the other for the right hand (each finger has two specific keys assigned and can push only those).



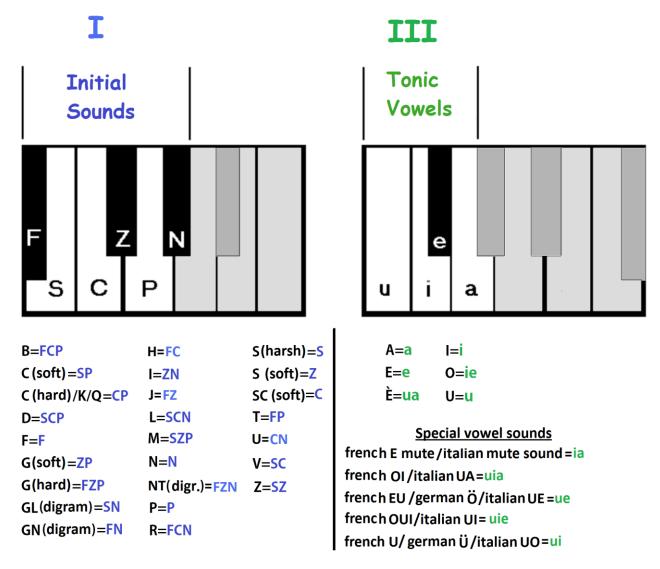
(Keyboard banks, phonic values and placement of the fingers)

As shown, each key represents a different phoneme, and it is associated with a literal symbol.

As it turn outs, the sounds that can be represented in the four banks are not only those corresponding to the 20 keys; there are numerous others associated with key combinations (as if they were piano chords). Let's take a look.

Sounds of the 1st and 3rd banks

Using only the 1st and 3nd banks, it is already possible to phonetically represent many of the most basic syllables consisting of a single vowel sound (e.g., "a", "i") or a vowel sound preceded by a consonant (e.g. "va", "lo", "re" etc.). Below, the list of phonemes present in these banks, together with the key (or keys) which are associated:



^{*} In the italian language The "c" and "g" can have a soft sound or a hard sound. They are soft when they are followed by "e" or "i" (e.g. genesi, gente, dicembre, circo), are hard when followed by "a", "o", "u" (e.g. gatto, goccia, cane, cuore). The letter "s", in turn, can have a sweet sound or a harsh

sound. It is sweet when it is mostly between vowels (e.g., viso, rosa, chiesa) or when it is followed by the consonants "b", "d", "g"", "l", "m", "n", "r", "v" (e.g.: sbarco, sdegno, sdoppiare); it is harsh mainly when it is preceded by another consonant (perso, falso), when it is at the beginning of the world followed by a vowel (sale, sole) or when it is double (rosso, assessore).

With these sounds, as said, it is already possible to write phonetically different words. For example, the word "pane" (bread) is formed from the syllables "pa" and "ne": the first will be written by simultaneously pressing the keys "P" of the 1st bank and the vowel "a" of 3rd bank, and the second by simultaneously pressing the keys "N" in the 1st bank and "e" of the 3rd bank. So with phonetic writing, "pane" will be written with two combinations:

The keyboard then produces a succession of syllables (notes) that can be read by the operator on a strip of paper or translated by the computer to reconstruct the single words:

S ZP	e	ME
F P	i e	ТО
SC P	i e	DO
S ZP	i	MI
СР	e	CHE
SC N	a	LA

The following are a few words with 1^{st} and 3^{rd} banks (phonetically written, without abbreviations).

Word		/	keys:
A	= a	FA/SE	= Fa/Ze
È	= ua	SA/NI	= Sa/Ni
IO	= ZNie	SO/NO	= Sie/Nie
LA	= SCNa	SCE/SO	= Ce/Zie
ME	= SZPe	CA/ME/RA	= CPa/SZPe/NCFa
VA	= SCa	FA/VO/RE	= Fa/Vie/FCNe
U/NA	= u/Na	PO/SI/TI/VA	= Pie/Zi/FPi/SCa
BE/NE	= FCPe/Ne	SENATO	= Se/Na/FPie

Sentences:

«Sono sani» = Sie/Nie/Sa/Ni

«Pino è fine» = Pi/Nie/ua/Fi/Ne

 $\langle \langle Se \ ti \ va \rangle \rangle = Se/FPi/SCa$

«Una fase positiva» u/Na/Fa/Ze/Pie/Zi/Fpi SCa

«Una cena penosa» = u/Na/SPe/Na/Pe/Nie/Za

«È scesa la neve» = ua/Ce/Za/SCNa/Ne/SCe

«Me la sono cavata» = SZPe/SCNa/Sie/Nie/CPa/SCa/FPa

«Una mela bacata» =u/Na/SZPe/SCNa/FCPa/CPa/FPa

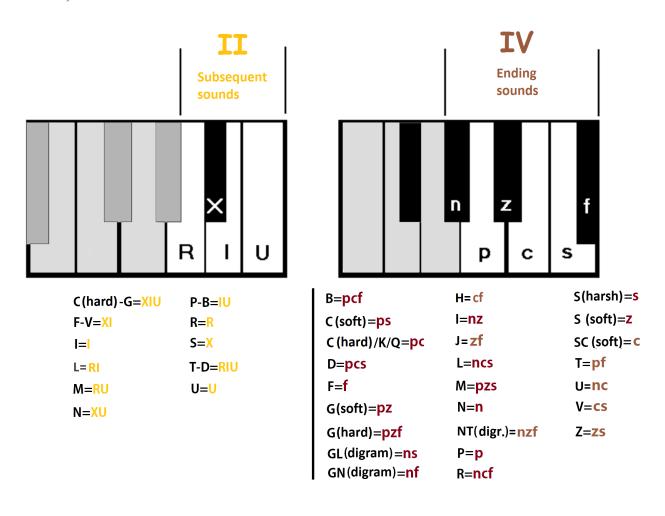
«Ada è venuta a Roma» = a/SCPa/ua/SCe/Nu/FPa/a/FCNie/SZPa

«Senato e Camera sono a favore» = Se/Na/FPie/e/CPa/SZPe/FCNa/Sie/Nie/a/Fa/SCie FCNe».

Sounds of the 2nd and 4th banks

In the syllable can then be additional sounds before and after the vowel sounds. They are represented with the 2^{nd} and 4^{th} banks.

Below a listing of the phonemes present in these banks (note that the 4th bank contains the same sounds of the 1st bank, although in reverse order, as if seen in a mirror).



Sentences (without abbreviations):

«Un primo piatto» = un/PRi/SZPie/PIapf/FPie

«Sono bravo con il piano» = Sie/Nie/FCPRa/Scie/CPien/incs/PIa/Nie

«Una scelta giusta» = u/Na/Cencs/FPa/ZPIus/FPa

«Avanti senza strappi» = a/SCan/FPi/Sen/SZas/FPRap/Pi. (*)

(* The consonant groups "STR", "SCR", "SPR" etc. (eg: strano, scrive, spruzzo etc.) are written anticipating the sound "S" in the preceding syllable ("lo strano"=SCNies/FPra/Nie; "si scrive"=Sis/CPRI/SCe etc.) or by placing the sound "S" in an autonomous combination with the e mute sound (ia) in the 3rd bank ("strano"=Sia/FPRa/Nie; "scrive"=Sia/CPRI/SCe etc.) or using the specific sound "ST" provided by the encoding for the Latin language in substitution of the J sound (e.g. "strappo"=FZRap/Pie).

Abbreviations

For professional use, the reporter uses a lot of abbreviations and acronyms in place of phonetic writing. This highly reduces the number of combinations needed to represent syllabic words. The abbreviations system may include the elimination of the vocals in the central part of the words, using the powerful 2nd bank to write the subsequent consonant sound and the elimination of the ending vowels (following a series of criteria or rules to determine the plurals and genders).

Below, a few example, subdivided by grammatical categories.

NOUNS

bisogno = FCPXienf dovere = SCPXIencf

Camera di deputati = CPXIUep fase = Faz

Commissione = CPRUis favorevole = FXIiecs

corso = CPRies frase = FRaz

deputati = SCPIUenz Governo = FZPXIencf

deputato = SCPep lavori = SCNRIienz

dibattito = SCPipcf livello = SCNXIencs

disegno di legge SCPRIepz Paese = PIez

Parlamento = Papzs senatore = SRUiencf

passaggio = PXapz senatori = SRUienz

posizione = PXizs sfavorevole = ZXIiecs

Presidente = PRuas signor = Sliencf

problema = PRiepcf signori = SIienz

riduzione = FCNRIUuzs soluzione = SRIuzs

Senato = SXUapf tassazione = FPXazs

VERBS

abbiamo = FCPIapzs sarà = SRa

 $\dot{e} = ua$ siamo = SIapzs

ha = FCa sono =SXUie

parlando = PRIanzs trovare = FPXIancf

parliamo = PRIapzs verrà = SCRa

possiamo = PUiepzs vorrei = SCRezf

possono = PUien

PREPOSITIONS/ARTICLES/ARTICOLATED PREPOSITIONS

a = a del = SCPencs

agli = SCNRIi della = SCPRIa

alla = SCNRIa delle = SCPRIe

alle = SCNRIe dello = SCPRIie

allo = SCNRIie di = SCPi

dagli = SCPXUIi il = incs

dalla = SCPXUIa la = SCNa

dalle = SCPXUIe nel = Nencs

dallo = SCPXUIie sugli = SRIie (opp. Suns)

degli = SCPRIi (opp. SCPens) sulla = SRIa

dei = SCPenz sulle = SRIe

sullo = SRIie una = CNXUie

una = CNXUa

ADJECTIVES

grave = FZPRacs questo = SZNie

internazionale = FZNXUancs tutta = FPRIUa

internazionali = FZNXUazf tutte = FPRIUe

morale = SZPRancs tutti = FPRIUi

questa = SZNa tutto = FPRIUie

queste = SZNe tutto = FPRIUie

questi = SZNi

ADVERBS/CONJUCTIONS

brevemente = FCPRe/SCepzs molto = SZPRIiepf

come = CPRUe (opp. CPUiepzs) non = Nien

in = in perché = PXIUua

infine = NXIin pertanto = PRIUanzf

invece = NXIeps quando = CPUanzs

SHORT FORMS

è approvato = Uap

non è approvato = Nuap

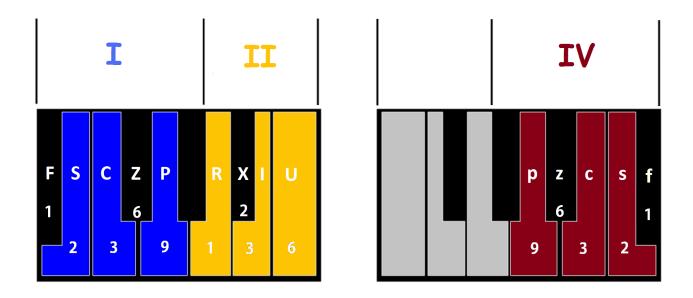
per quanto riguarda = PRipzf

Signor Presidente, onorevoli colleghi = SIUiepc

METHOD FOR WRITING NUMBERS

As regards the specific problem of writing the numbers, there are two possibilities, one of which is to write write the words as they are spoken, according to the general procedure.

The second option is to use a number system that allows a significant reduction in strokes through the utilization of a specific numeric value assigned to each Michela key.



For the implementation of this method the first, the second and fourth banks are taken as specific locations, respectively, of the hundreds, tens and units, while the third bank (used for the vowels) is not used: this fact immediately distinguishes the notes which express digits from all the others, in which the bank of "vowel" is always utilized. Unrepresented numbers are obtained by adding the values of the other keys (e.g. 4=3+1, 5=2+3, 7=6+1, 8=6+2).

Below a diagram of the numbers up to 999.

f=1	R=10, Rf=11, Rs=12 ()	F=100, Ff=101, Fs=102 ()
s=2	X=20	S=200
c=3	I=30	C=300
cf=4	RI=40	FC=400
cs=5	XI=50	SC=500
z=6	U=60	Z=600
zf=7	RU=70	FZ=700
zs=8	XU=80	SZ=800
p=9	IU=90	P=900, PIU=990, PIUp=999 ()

For numbers beyond 999, the following clarification applies. To each stroke in the number method corresponds a ternary group of numbers expressed with arabic numerals. Because the numbers are "upbeat", in groups of three digits, which gradually include the hundreds (999), the thousands 999.999), the millions (999.999.999), billions (999.999.999) and so on, the Michela number method conforms with this criterion: the horizontal "contiguity" horizontal of such groups does match a vertical "contiguity", in the sense that the ternary groups are expressed with successive strokes. For instance, the number 999.990 will be written with two strokes = PIUp/PIU, so the first stroke express the digit of 999 and soon after a second stroke will express the digit 990. If the strokes were three, the first would express obviously the value of the millions, the second the value of thousands, the third one the hundreds, and so on.

So, summing up, one stroke can express value numbers not exceeding 999; two strokes can express value numbers no more than 999.999, three strokes can express value numbers non more than 999.999.999 etc..

In the case in which there is a decimal number (e.g. 90,10), between the first stroke reproducing 90 (IU) and the one that express 10 (R) is inserted a third stroke, an "e" in the third bank that will indicate the comma, so 90,10=IU/e/R.

Examples:

f/F=1100

F/R=100.010

SCXz/PIzf=526.937

ZIs/FIUp=632.199

f/CRcf/SCUzs/SIz=1.314.568.236.

WRITING SYSTEMS FOR OTHER LANGUAGES

Due to the fact that the Michela system is totally phonetic is possible to use it to record other languages, also if not known by the reporter. In this case the reporter will just write the words as they sounds.

It's also possible to apply the system to other languages (in this case known by the operator), as shown by the following phonetic tables published by the inventor for using the system in other languages. (The tables for English and French, for convenience, have been translated in English; the tables for Spanish, Latin and Russian are instead still shown with the original graphic signs).

Stenographic alphabet for United Kingdom and the United States

1st (and 4th) bank

F (f)	f, ph, gh	father, prophet,	ZP (pz)	g, j	giant, just
		enough, cough	FZP (pzf)	g	green, gold
S (s)	S	son, possession, less, this	SZP (pzs)	m	more, museum
C (c)	sh, ti, scr	she, wish, scream, depredation	N (n)	n	niece, none
FC (cf)	h	house, have, horse, hat, behind	FN (nf)	(open use) *proposed for: ins, uns nce	unsecure, insist,
SC (cs)	V	vine, violent	SN (ns)	ng (gn)	gnaws,
Z	S	usage, useful,	1		writing, king
		house, these, is	CN (nc)	w	water, wine,
FZ (zf)	th	the, brother, earth,	-		wolf
		weal <i>th</i>	FCN (ncf)	r	<i>r</i> efuse,
SZ (zs)	Z	horizon, dozen			<i>r</i> eimburse
P (p)	р	people, reptile,	SCN (ncs)	I	lance, literal
			ZN (nz)	У	yester, yet,
FP (pf)	t	trifle, trade			yes, boy
SP (ps)	ch	which, each	FZN (nzf)	(open use) *proposed for: nt (n't)	intense, entire can't, rent, font
CP (pc)	c, k, q	because, king	SZN (nzs)	X	exit, fox,
FCP (pcf)	b	<i>b</i> ecause			maximum
SCP (pcs)	d	<i>d</i> ear			

2nd bank

R	r	great, trifle, gradual,
		sc <i>r</i> ape
X	S	observe, gipsy
1	i	italian, soldier
RI	I	glass, class, clew,
		p/ummer
ΧI	w, f	dwarf, dwell, twelve
U	u	habitual, gradual
RU	m	at <i>m</i> osphere,
		arith <i>m</i> etic
XU	n	garde <i>n</i> er
UI	p, b	sport (with harsh s)
		(used also for briefs)
RIU	t, d	station (with harsh
		s) (used also for
		briefs)
XIU	c, g, k	scarf (with harsh s)
		(used also for briefs)

3rd bank

	1	
а	а	alg <i>e</i> bra, <i>a</i> live,
		aft <i>e</i> r,
		br <i>ea</i> kfast
е	e, a, ea	federal, age,
		gate, earth,
		br <i>ea</i> d
i	i, y, ea, ee, eo	fiddle, fitly,
		feast, feel,
		p <i>eo</i> ple
ia	i, y	wine, I, why,
		myself
ie	o, a, au, aw	God,
		fortunate,
		small, bawble
u	u, 00	fr <i>u</i> itful,
		fr <i>au</i> dful, w <i>oo</i> l
ua	u, eau	usage, useful,
		f <i>u</i> neral,
		b <i>eau</i> tiful
ue	u, ou	<i>u</i> mbrella,
		h <i>u</i> sband, b <i>u</i> t,
		ch <i>ou</i> gh, <i>tou</i> gh
ui	ou	our, without,
		th <i>ou</i>
uia	(open use)	
uie	(open use)	
	*proposed for Schwa	th <i>e, a</i> bout
	sound (ə), no vowel	

Example of shorthand notes in English

-e	Α
S-encf	cer
FP-uien	tain
CP-ins	king
SZP-a	ma
CP-ins	king
CN-an	one
SCP-ezs	day
FC-iz	his
-en	en
FPR-anf	trance
-in	in
FP-u	to
-е	а
FP-uen	town
-apf	at
FP-u	two
-ie	'o
CPRI-iepc	clock
-in	in
FZ-uie	the
-af	af
FPXU-un	^ternoon

FZ-i	the
SNUapf	Senat
	е
S-enzf	sent
S-uepzs	some
SCP-uiep	depu
FP-is	ties
FP-u	to
CP-iepzs	com
PRI-e	ple
SZP-enzf	ment
FC-ipzs	him
-nzf	•
FZ-uie	the
CN-an	one
CN-u	who
CN-ies	was
FP-u	to
SIU-ipc	speak
FCPXIUan	began
FZ-ues	thus
NX	:
FN-nf	11
-a	Α

le
xan
der
the
great
,
the
great
A
le
xan
der
11
and
stop
ped
shor
t
•
The
king
who
was

Stenographic alphabet for France and Belgium

1st a(and 4th) bank

F (f)	f ph	fait prophete
S (s)	s c ç	savant
		societé
C (c)	sc ch	scène chose
FC (cf)	h	hèros
SC (cs)	V	vertu, veuve
Z	S	usage, aise
FZ (zf)	jg	juge, jalousie
SZ (zs)	Z	<i>zè</i> le
P (p)	р	paix, pape
FP (pf)	t	têt <i>e</i>
SP (ps)	(open	
	use)	
CP (pc)	c, k, qu	cave, qui
FCP (pcf)	b	<i>b</i> o <i>b</i> ine
SCP (pcs)	d	<i>déd</i> ier

	T	T
ZP (pz)	(open use)	
FZP (pzf)	g	<i>g</i> uerre,
		glace
SZP (pzs)	m	<i>m</i> a <i>m</i> an
N (n)	n	non, nonne
FN (nf)	gn	<i>gn</i> ome
SN (ns)	il, eil	oeil ouille
CN (nc)	ou	ouate
FCN (ncf)	r	rire
SCN (ncs)	I	légal
ZN (nz)	hi, hy, i	<i>hy</i> pothése
FZN (nzf)	(open use)	
SZN (nzs)	х	luxe, index

2nd bank

3rd bank

R	r	prêtre
Х	S	pseudonyme
I	i, e, a	pit <i>i</i> é, r <i>e</i> el
RI	I	g/obe, b/oc
XI	v, f, ph	s <i>ph</i> ére
U	u	tuer
RU	m	revête <i>m</i> ent
XU	n	te <i>n</i> ir
UI	рb	repos, rebelle
RIU	t, d	retard, redite
XIU	c, g, k	recours

а	a e	apparence
е	é, e, ai	mer, vrai
i	i, y	liquide, jury
ia	e (mute)	enfle
ie	o, au, eau	oser, faux
u	ou	p <i>ou</i> pé
ua	ê, è, ai, i	être, frère, lin
ue	eu, œ	reux, cœur
ui	u	usurper
uia	oi	<i>oi</i> seau, m <i>oi</i> s
uie	ui, oui	br <i>ui</i> t, ébl <i>oui</i> r

Example of French shorthand notes

SCP-e	Dés	PRI-ui	plus	SCPR-uia	droit
CP-ien	qu'on	C-uancf	cher	S-uincf	sur
а	а	SCP-an	dans	SCN-ia	le
an	an-	PRI-ui	plu	FCPRI-e	blé
N-ien	non	ZI-uencf	sieurs	-nzf	
S-e	cé	SC-incs	villes	SCN-e	Les
-uin	une	SCP-i	d'i	SCPRUie	démo
SZP-ie	mau	FP-a	ta	CPRapf	crates
SCU-az	vaise	SCN-i	lie	CP-i	qui
FCN-e	ré	-uen	on	PR-ie	pro
CP-iencs	col	-a	а	FP-es	tes
FP-e	te	SCPRUan	deman	FP-ia	stent
SCP-ui	du	SCP-e	dé	FP-u	tou
FCPRI-e	blé	S-i	si	FZ-uncf	jours
-е	et	SCN-ia	le	CP-ien	con
CP-ua	que	SZPRUan	moment	FPR-e	tre
P-ancf	par	N-e	n'é	SCN-ancf	l'ar
SCN-a	là	FP-e	tait	FCP-i	bi
SCN-ua	le	P-a	pas	FPR-uancf	traire
P-en	pain	SCXUui	venu	SCP-e	des
-ua	est	SCPR-e	de ré	SCP-e	de
SCPXI-e	deve	SCP-uiencf	duire	CPRe	créts
N-ui	nu	SCN-ia	le	SCN-uia	loi
I	<u>. </u>	L	<u>. </u>	L	1

LATIN

ALFABETO PER LA LINGUA LATINA

I E IV SERIE					II S	ERIE
1.	f ph	fili phoebus	1		r	patres
2 :	s	pes — assis	2	:	s	scripsit
3 0	sc	su <i>sc</i> ipe	3	U	i	officio .
4 . U	h.	honor	4	٠ ں	1	clangor
5 :0	v	vates	5	:0	v	adventus
6 /	s	musa	6	\	u	pueri
7 . /	st	post est	7	. \	m	smaragdus
8 : /	z - t	zona amicitia	8	: \	n	am <i>n</i> is
9 0	p	p oena	9	U\	p	spatium
10 . 0	t	<i>t</i> ribunus	10	· 0\	t	contemptum
11 : 0	С	cedrus (11	:0\	сq	s <i>c</i> andere
12 U n	c ch	causa christus				
13 · Un b benevolus						
13 · U n	D	benevolus	1			
14 :0 0	d	dedit			III Si	ERIE
1					III Si	ERIE
14 :0 0	d g	dedit	1	•	III Si	anima
14 :∪ ∩ 15 ✓∩	d	de d it g yrus g enitrix	1 2			
14 :U ∩ 15 /∩ 16 · /∩	d g g gh	dedit gyrus genitrix gaius	2	: U	а	anima
14 : U ∩ 15	d g g gh m	dedit gyrus genitrix gaius magnus	2	- 1	a eæœ	anima cena cælum
14 : U ∩ 15	d g g gh m n	dedit gyrus genitrix gaius magnus nitor nummus	2	U	a eæœ	anima cena cælum irides
14 : U ∩ 15	d g g gh m n	dedit gyrus genitrix gaius magnus nitor nummus	2 3 4	υ υ.	a eæœ i y	anima cena cælum irides mancanza di vocale
14 : U ∩ 15	d g g gh m n gn	dedit gyrus genitrix gaius magnus nitor nummus magnus	2 3 4 5	υ υ.	a eæœ i y	anima cena cælum irides mancanza di vocalo officio
14 : U ∩ 15	d g g gh m n gn	dedit gyrus genitrix gaius magnus nitor nummus magnus cauda	2 3 4 5 6	υ υ.	a eæœ i y	anima cena cælum irides mancanza di vocalo officio
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Esempio di sten	oscr	itto in lingua latina.	
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SPANISH

ALFABETO PER LA LINGUA SPAGNUOLA

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Esempio di stenoscritto in lingua spagnuola.

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GERMAN

ALFABETO PER LA LINGUA TEDESCA

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Esempio di stenoscritto in lingua tedesca.

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RUSSIAN

ALFABETO PER LA LINGUA RUSSA

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Esempio di stenoscritto in lingua russa.

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