

Consideration of the encoding of Garay with updated user feedback

Andrij Rovenchak, Abdou Souleye Faye, and Charles L. Riley (12 January 2022)

1. Introduction

This contribution to Garay encoding has been developed as a response to Michael Everson's 2016 revised proposal ([L2/16-069, N4709](#)) and to add further clarification to issues that were addressed in [L2/19-163](#) as a response to the Script Ad Hoc recommendations referenced in [L2/18-168](#), based on further reflection by a son of the inventor of the script on current practices in usage.

We mostly adhere to Michael Everson's proposal [L2/16-069](#) regarding the encoding ranges and general principles of character ordering.

2. Consonants

Since the shapes of the Garay diacritic $\overset{\circ}{\cdot}$ to mark the vowel [ɛ] and the symbol used to write prenasalized consonants ($\underset{\cdot}{\text{A}}$, $\underset{\cdot}{\text{D}}$, $\underset{\cdot}{\text{J}}$, $\underset{\cdot}{\text{G}}$) are similar, we took into account the UTC feedback [L2/19-163](#) and decomposed the prenasalized letters as follows:

$\underset{\cdot}{\text{A}}$ [ɱb] = $\text{A} + \overset{\circ}{\cdot}$ (U+10D74 GARAY SMALL LETTER BA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{A}}$ [ɱb] = $\text{A} + \overset{\circ}{\cdot}$ (U+10D54 GARAY CAPITAL LETTER BA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{D}}$ [ɱd] = $\text{D} + \overset{\circ}{\cdot}$ (U+10D7A GARAY SMALL LETTER DA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{D}}$ [ɱd] = $\text{D} + \overset{\circ}{\cdot}$ (U+10D5A GARAY CAPITAL LETTER DA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{J}}$ [ɱʃ] = $\text{J} + \overset{\circ}{\cdot}$ (U+10D75 GARAY SMALL LETTER JA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{J}}$ [ɱʃ] = $\text{J} + \overset{\circ}{\cdot}$ (U+10D55 GARAY CAPITAL LETTER JA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{G}}$ [ɱg] = $\text{G} + \overset{\circ}{\cdot}$ (U+10D79 GARAY SMALL LETTER GA, U+10D66 GARAY VOWEL SIGN E)

$\underset{\cdot}{\text{G}}$ [ɱg] = $\text{G} + \overset{\circ}{\cdot}$ (U+10D59 GARAY CAPITAL LETTER GA, U+10D66 GARAY VOWEL SIGN E)

The combining dot above is used for the original letter of the Garay alphabet

$\underset{\cdot}{\text{G}}$ [ɱ] = $\text{G} + \overset{\circ}{\cdot}$ (U+10D79 GARAY SMALL LETTER GA, U+10D68 GARAY COMBINING DOT ABOVE)

$\underset{\cdot}{\text{G}}$ [ɱ] = $\text{G} + \overset{\circ}{\cdot}$ (U+10D59 GARAY CAPITAL LETTER GA, U+10D68 GARAY COMBINING DOT ABOVE)

as well as to represent foreign sounds

// [sʕ] (Arabic ص) = // + ̣ (U+10D76 GARAY SMALL LETTER SA, U+10D68 GARAY COMBINING DOT ABOVE)

Foreign sounds can be also obtained using the combining diaeresis:

// [z] (Arabic ز) = // + ̥
(U+10D76 GARAY SMALL LETTER SA, U+10D69 GARAY COMBINING DOUBLE DOT ABOVE)

and by using digraphs:

حڤ [q] (ق) = ح + ڤ (U+10D7B GARAY SMALL LETTER XA, U+10D70 GARAY SMALL LETTER A)

//ڤ š [ʃ] = ڤ + // (U+10D70 GARAY SMALL LETTER A, U+10D76 GARAY SMALL LETTER SA)

ڤڤ [v] = ڤ + ڤ (U+10D70 GARAY SMALL LETTER A, U+10D77 GARAY SMALL LETTER WA)

Geminate (double or long) consonants are represented using the circumflex diacritic:

̂ kk [k:] = ㄥ + ̂
(U+10D73 GARAY SMALL LETTER KA, U+10D67 GARAY CONSONANT GEMINATION MARK)

In the case of prenasalized consonants, two diacritics are required:

̣̂ ndd [nd:] = ڤ + ̣ + ̂ (U+10D7A GARAY SMALL LETTER DA, U+10D66 GARAY VOWEL SIGN E ,
U+10D67 GARAY CONSONANT GEMINATION MARK)

For legacy purposes, in order to be able to digitize older Garay manuscripts properly, we suggest encoding old letter shapes for [k] and [n] (with three "teeth") separately at

10D64 𐌆 GARAY CAPITAL LETTER OLD KA

10D65 𐌇 GARAY CAPITAL LETTER OLD NA

10D84 𐌆 GARAY SMALL LETTER OLD KA

10D85 𐌇 GARAY SMALL LETTER OLD NA

in addition to modern shapes

10D53 𐌆 GARAY CAPITAL LETTER KA

10D61 𐌇 GARAY CAPITAL LETTER NA

10D73 ㄥ GARAY SMALL LETTER KA

10D81 𐌆 GARAY SMALL LETTER NA

The ordering of consonants is based on the numerical values of the respective letters, see Fig. 1.

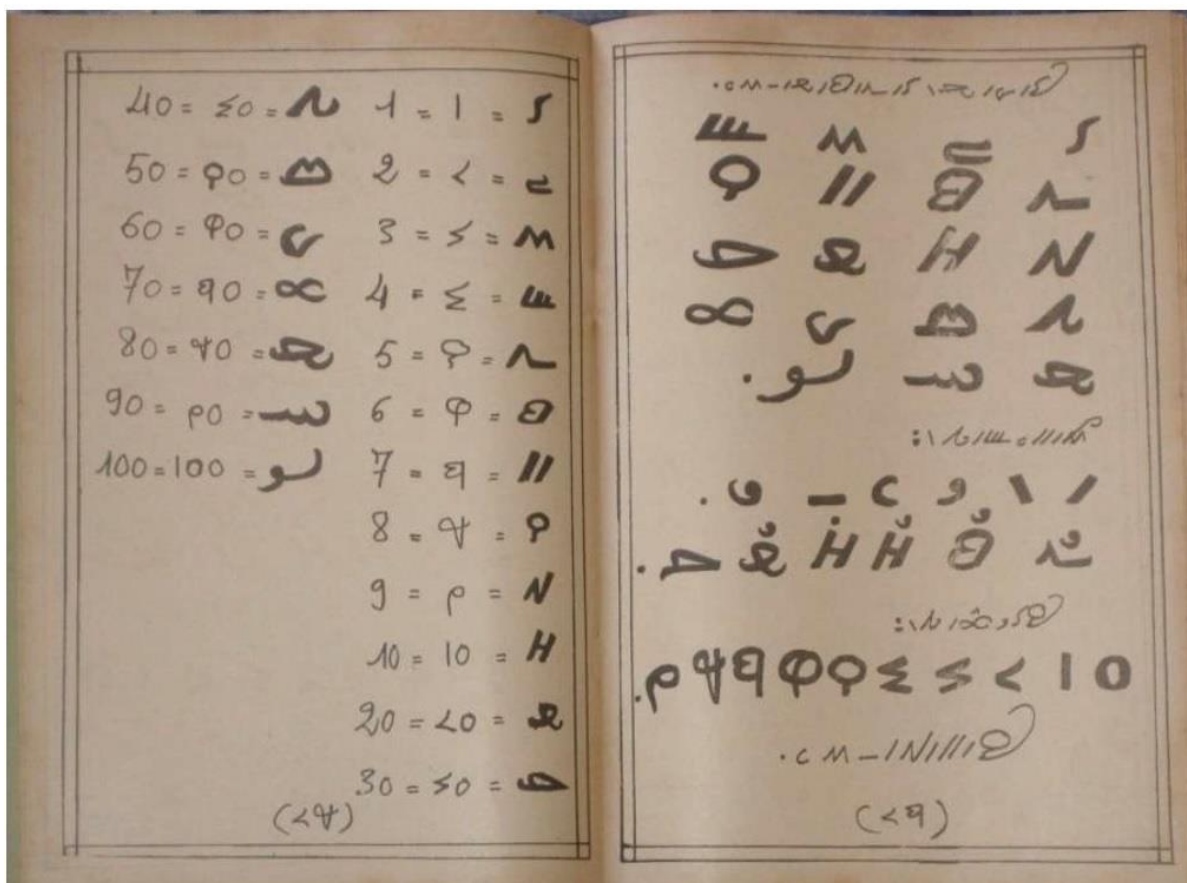


Figure 1: Letter ordering in Garay. Note old shapes for KA and NA.

(Source: <https://catalogingafricana.files.wordpress.com/2016/03/fayems1.pdf>)

3. Vowels

There are a few changes in the representation of vowels. The major one is the encoding of two shapes of the "squiggle" ∩ with different heights (see Fig. 2). This reflects the modern usage of the Garay alphabet. Below, examples of vowels are shown, with the complete list of open syllables given in Table 2. Note that vowel length is marked by a horizontal line

10D4E _ GARAY VOWEL LENGTH MARK

Three vowels are denoted by simple symbols:

ba [ba]	∩	ka [ka]	∩
baa [ba:]	_∩	kaa [ka:]	_∩
bi [bi]	∩	ki [ki]	∩
bii [bi:]	_∩	kii [ki:]	_∩
bo [bɔ]	∩	ko [kɔ]	∩
boo [bɔ:]	_∩	koo [kɔ:]	_∩

Another two vowels can be marked by a diacritic depending on the preceding consonant:

be [bɛ]	ɿʌ	ke [kɛ]	ʹ
bee [be:]	—ɿʌ	kee [kɛ:]	—ʹ
bé [be]	ɿʌ	ké [ke]	ɿʹ
bée [be:]	—ɿʌ	kée [ke:]	—ɿʹ

Note that in older orthography, bé [be] was ʹʌ. The above examples reflect modern usage.

The combining diacritic

10D66 ◌̣ GARAY VOWEL SIGN E

is used with letters not existing as prenasalized variants. Otherwise, a small "squiggle"

10D4D ɿ GARAY VOWEL SIGN EU

is applied. For geminate consonants, the following principle holds:

ndde [nd:ɛ]	ɿ̣	kke [k:ɛ]	ʹ̣
nddé [nd:e]	ɿ̣̣	kké [k:e]	ɿ̣̣̣

The encoding order for *kke* ʹ̣ is the same as for *ndd* ɿ̣:

ʹ̣ kke [k:ɛ] = ʹ + ◌̣ + ◌̣ (U+10D73 GARAY SMALL LETTER KA, U+10D66 GARAY VOWEL SIGN E , U+10D67 GARAY CONSONANT GEMINATION MARK)

Finally, four vowels are denoted by two symbols, one of which is the small "squiggle":

bë [bə]	ɿʌ	kë [kə]	ɿʹʌ
bëë [bə:]	—ɿʌ	këë [kə:]	—ɿʹʌ
bih* [biʰ]	ɿʌ	ki [kiʰ]	ɿʌ
biih [bi:ʰ]	—ɿʌ	kii [ki:h]	—ɿʌ
bó [bo]	ɿʹʌ	kó [ko]	ɿʹʌ
bóo [bo:]	—ɿʹʌ	kóo [ko:]	—ɿʹʌ
bu [bu]	ɿʹʌ	ku [ku]	ɿʹʌ
buu [bu:]	—ɿʹʌ	kuu [ku:]	—ɿʹʌ

* The *ih* digraph is used here to denote a special "strong" articulation of [i] (conventionally designated as [iʰ]). Such pronunciation is not reflected in the official Roman orthography for Wolof and is a dialectal feature. Whether it is related to [i], a –ATR (retracted tongue root) pair for [i], requires additional studies in the domain of phonology. In previous Unicode proposals for Garay this sound was incorrectly denoted by ü following Dalby's table (Dalby 1966).

Word-initially, vowels require a special carrier in the role similar to the Arabic 'aleph (ا) being a larger "squiggle":

10D50 ʃ GARAY CAPITAL LETTER A

10D70 ʃ GARAY SMALL LETTER A

Namely,

u [u]	ó [o]	o [ɔ]	ih [ih]	i [i]	é [e]	e [ɛ]	ë [ə]	a [e], à [a]
ʃʃʃ	ʃʃʃ	ʃʃ	ʃʃ	ʃ	ʃʃʃ	ʃʃ	ʃʃʃ	ʃʃ

Examples of vowel usage are shown in Figs. 2–7.

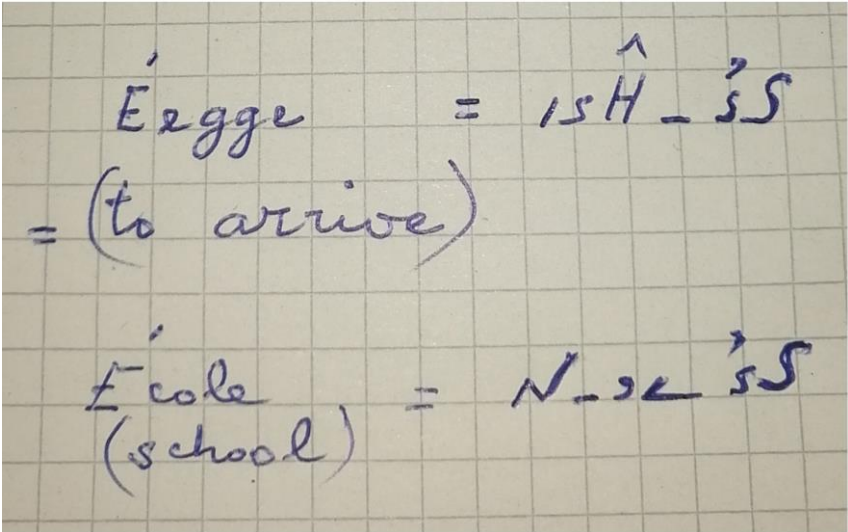


Figure 2: Examples of word-initial [ɛ] written with "squiggles" of different heights: ʃʃ

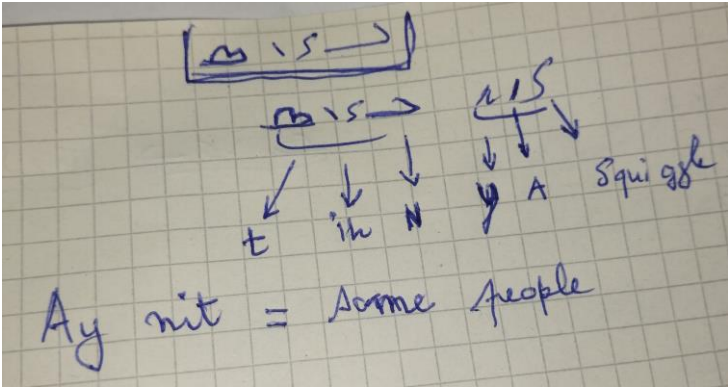


Figure 3: The Wolof words Ay nit 'some people': ΔΔ\ʃ Δ \ʃʃ

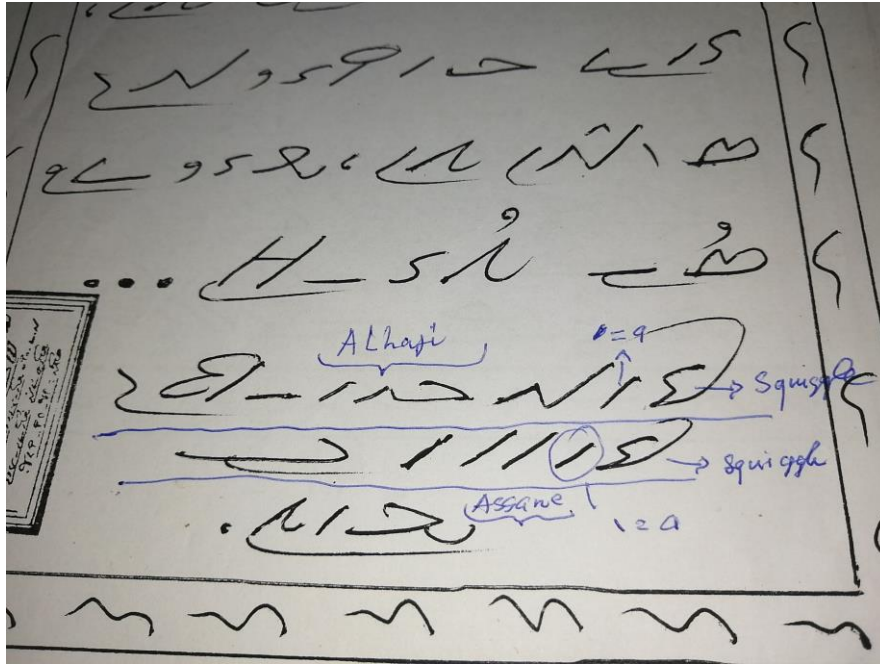


Figure 4: The last three lines contain proper names, Alhaji Assane Fay:

١٥ / ١٥ / ١٥
 ١٥ / ١٥ / ١٥
 ١٥ / ١٥

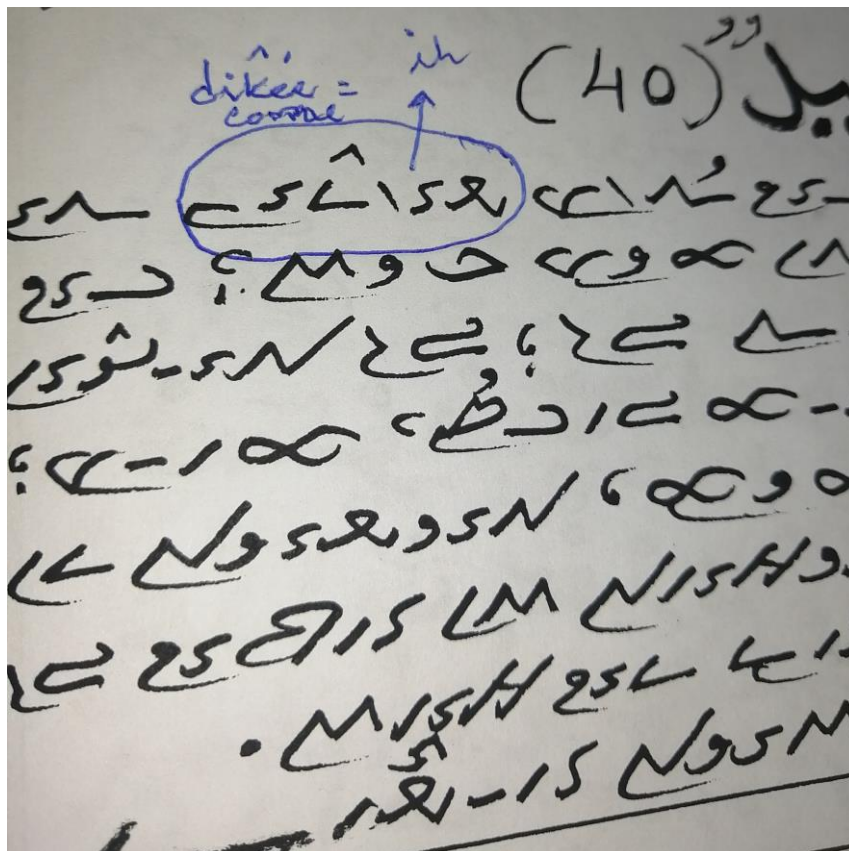


Figure 5: The syllable *kkée* in the encircled word *dikkée* 'come' is written كك^{\wedge} instead of كك^{e} for simplicity (cf. Fig. 6). Note several occurrences of the Arabic comma (,) and semicolon (;)

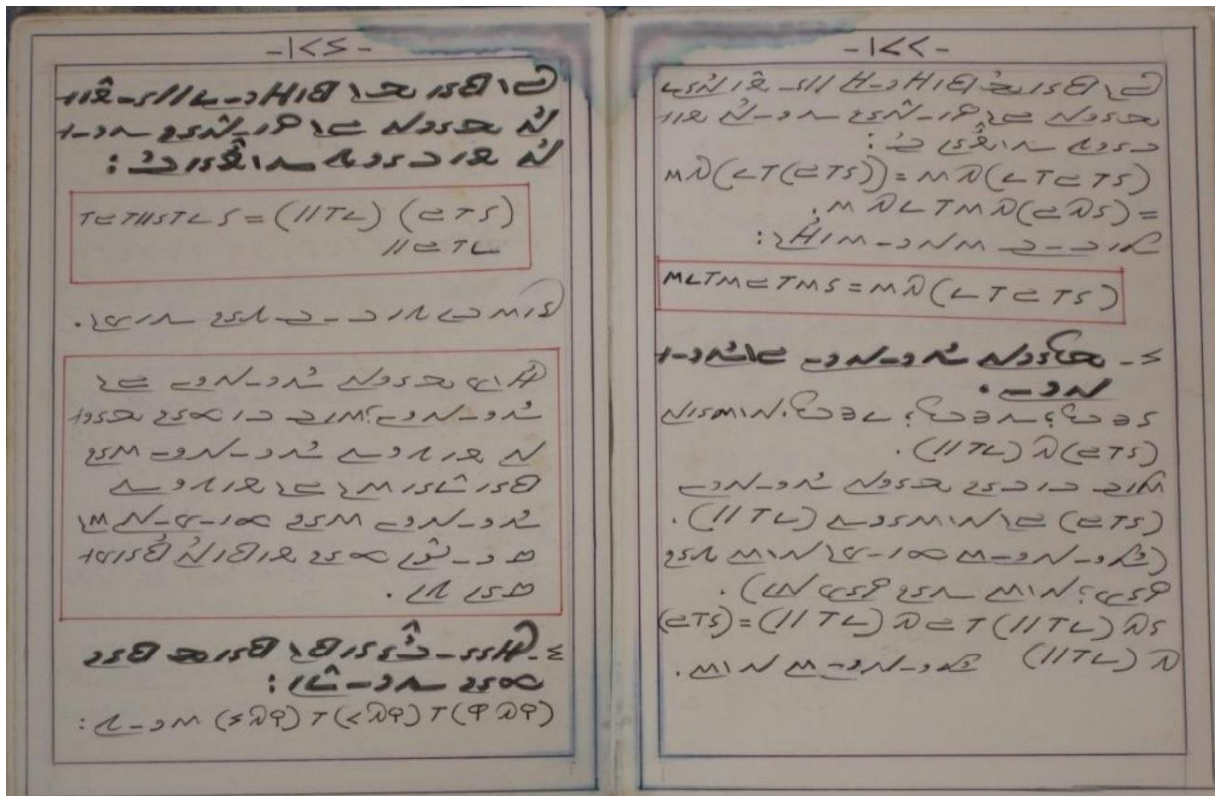


Figure 6: The syllable *nné* (third row from below on the left) in the word *Géennéaji* is written $\hat{n}n\acute{e}$ (cf. Fig. 5). Note slanted symbols τ and \angle for GARAY PLUS SIGN and GARAY MINUS SIGN, respectively. Page numbers on the top read 122 (\llcorner , right) and 123 (\lrcorner , left), in the order typical of books in right-to-left scripts

Vowel symbols do not appear as standalone characters. Words initially, they are preceded by \hat{a} or \hat{s} (GARAY CAPITAL LETTER A or GARAY SMALL LETTER A). Word internally and word finally, two consecutive vowels or diphthongs are not allowed by Wolof phonotactics, so epenthetic consonants are inserted, cf. Fig. 7.

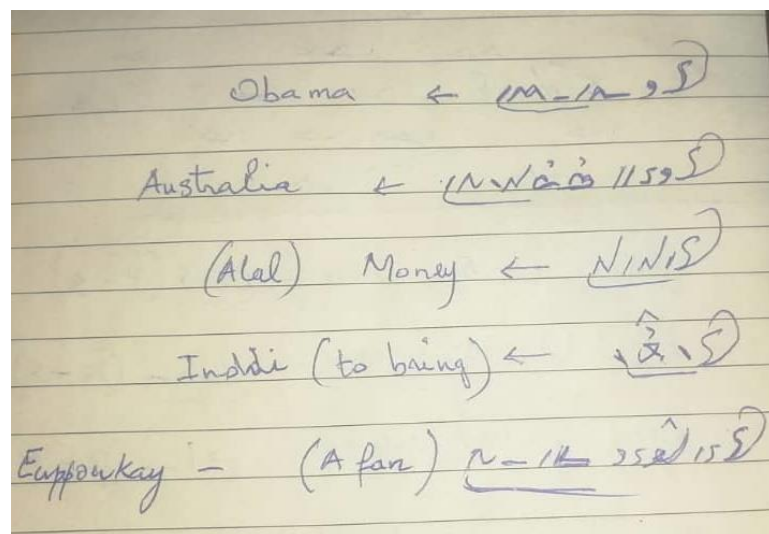


Figure 7: Examples of words with initial vowels. Note initial \hat{a} . In the second line, ‘Australia’ is written as $\hat{a}n\hat{n}\hat{a}n\hat{a}i\hat{y}\hat{a}$ [ostereliya], with \hat{n} [y] separating [i] and [a]

4. Mathematical notation

Following our previous proposal [L2/19-162](#) on Garay mathematical notation we added so far two symbols for mathematical operations,

U+10D6B 𐎡 GARAY PLUS SIGN

U+10D6C 𐎢 GARAY MINUS SIGN

Such slanted shapes are preferable (see Fig. 6) comparing to upright variants, U+22A5 ⊥ UP TACK and U+22A4 ⊥ DOWN TACK (as mentioned in [L2/19-173](#)).

The multiplication sign 𐎣 is identical to U+10D5C GARAY CAPITAL LETTER YA.

The Bidi_Class of the Garay digits is AN (Arabic_Number) since they behave like decimal digits in the Arabic script: the highest digit is placed on the left although the script direction is right-to left, e. g.: 30 is 𐎠𐎡, not 𐎡𐎠, see Figs. 8 and 9 and also Fig. 6.

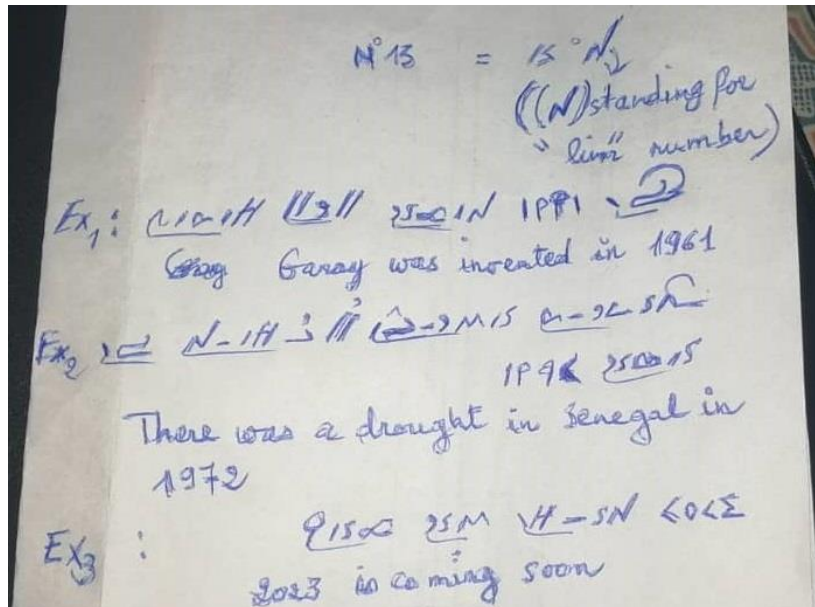


Figure 8: Examples of numbers in Garay. The first line contains a numero analog based on 𐎡 GARAY SMALL LETTER LA

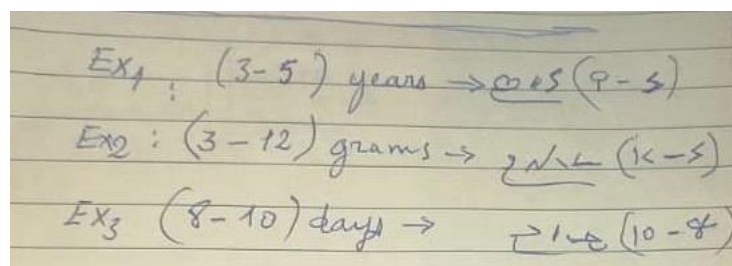




Figure 9: More examples of numbers in Garay showing ranges

5. Collation order

The first column of the encoding table contains ten digits followed by four vowel signs, vowel length mark, and *sukun*.

Consonant characters are ordered according to their numerical values (as given by Dalby 1966; see Table 1 and also Fig. 1). The last consonant in the sequence,  GARAY CAPITAL LETTER HA, is added after the letter  GARAY CAPITAL LETTER PA with the highest numerical value 100. These are followed by two old shapes for letters KA and NA. Codepoints for small letters are shifted by 32 (hexadecimal x20) with respect to their capital counterparts.

Vowel diacritics and some other signs (mathematical notation, word gemination mark) are placed in the third column, after capital letters.

Table 1. Numerical values of Garay letters




















1		10	
2		20	
3		30	
4		40	
5		50	
6		60	
7		70	
8		80	
9		90	
		100	

Table 2. Open syllables in Garay

u [u] uu [u:]	ó [o] óo [o:]	o [ɔ] oo [ɔ:]	ih [ih] iih [i:h]	i [i] ii [i:]	é [e] ée [e:]	e [ɛ] ee [ɛ:]	ë [ə] ëë [ə:]	a [e], à [a] aa [a:]		
ʊ	ɔ	ɔ	ɪ	ɪ	ɛ	ɛ	ə	ɛ	ɛ	
ʊʊ	ɔɔ	ɔɔ	ɪɪ	ɪɪ	ɛɛ	ɛɛ	əə	ɛɛ	ɛ	[ʔ] (word-initially)
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	b [b]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	bV:
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	bb [b:]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	mb [m̩b]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	mbb
ʊɛ	ɔɛ	ɔɛ	ɪɛ	ɪɛ	ɛɛ	ɛɛ	əɛ	ɛɛ	ɛ	c [c]
ʊɛ	ɔɛ	ɔɛ	ɪɛ	ɪɛ	ɛɛ	ɛɛ	əɛ	ɛɛ	ɛ	cV:
ʊɛ	ɔɛ	ɔɛ	ɪɛ	ɪɛ	ɛɛ	ɛɛ	əɛ	ɛɛ	ɛ	cc
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	d [d]
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	dd
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	nd [n̩d]
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	ndd
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	f [f]
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	ff
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	g [g]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	gg
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	ng [ŋg]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	ngg
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	ŋ [ŋ]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	ŋŋ
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	h [h]
ʊɔ	ɔɔ	ɔɔ	ɪɔ	ɪɔ	ɛɔ	ɛɔ	əɔ	ɛɔ	ɔ	hh
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	j [j]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	jj
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	nj [ŋj]
ʊɪ	ɔɪ	ɔɪ	ɪɪ	ɪɪ	ɛɛ	ɛɪ	əɪ	ɛɪ	ɪ	njj

u [u] uu [u:]	ó [o] óo [o:]	o [ɔ] oo [ɔ:]	ih [ih] iih [i:h]	i [i] ii [i:]	é [e] ée [e:]	e [ɛ] ee [ɛ:]	ë [ə] ëë [ə:]	a [e], à [a] aa [a:]		
سك	سوك	سول	صك	ص	سك'	ك'	سك	ك	ك	k [k]
سك^	سوك^	سول^	صك^	ص^	سك'^	ك'^	سك^	ك^	ك^	kk
سك/	سوك/	سول/	صك/	ص/	سك'/	ك'/	سك/	ك/	ك/	l [l]
سك~	سوك~	سول~	صك~	ص~	سك'~	ك'~	سك~	ك~	ك~	ll
سم	سوم	سول	صم	صم	سم'	م'	سم	م	م	m [m]
سم^	سوم^	سول^	صم^	صم^	سم'^	م'^	سم^	م^	م^	mm
سند	سوند	سول	صند	صند	سند'	ند'	سند	ند	ند	n [n]
سند^	سوند^	سول^	صند^	صند^	سند'^	ند'^	سند^	ند^	ند^	nn
سندل	سوندل	سولل	صندل	صندل	سندل'	دل'	سندل	دل	دل	ñ [ɲ]
سندل~	سوندل~	سولل~	صندل~	صندل~	سندل'~	دل'~	سندل~	دل~	دل~	ññ
سپ	سوپ	سول	صپ	صپ	سپ'	پ'	سپ	پ	پ	p [p]
سپ^	سوپ^	سول^	صپ^	صپ^	سپ'^	پ'^	سپ^	پ^	پ^	pp
سپق	سوپق	سولق	صپق	صپق	سپق'	ق'	سپق	ق	ق	q [q] (ق)
سر	سور	سول	صر	صر	سر'	ر'	سر	ر	ر	r [r]
سر^	سور^	سول^	صر^	صر^	سر'^	ر'^	سر^	ر^	ر^	rr
س//	سور//	سول//	ص//	ص//	س//'	//'	س//	//	//	s [s]
س//^	سور//^	سول//^	ص//^	ص//^	س//'^	//'^	س//^	//^	//^	ss
س//ص	سور//ص	سولص	ص//ص	ص//ص	س//ص'	ص//'	س//ص	ص//	ص//	ş [s°] (ص)
س//س	سور//س	سولس	ص//س	ص//س	س//س'	س//'	س//س	س//س	س//س	š [ʃ]
ست	سوت	سول	صت	صت	ست'	ت'	ست	ت	ت	t [t]
ست^	سوت^	سول^	صت^	صت^	ست'^	ت'^	ست^	ت^	ت^	tt
سپس	سوپس	سولس	صپس	صپس	سپس'	سپس'	سپس	سپس	سپس	v [v]
سپو	سوپو	سولو	صپو	صپو	سپو'	پو'	سپو	پو	پو	w [w]
سپو^	سوپو^	سولو^	صپو^	صپو^	سپو'^	پو'^	سپو^	پو^	پو^	ww
سخ	سوخ	سولخ	صخ	صخ	سخ'	خ'	سخ	خ	خ	x [x~χ]
سخ^	سوخ^	سولخ^	صخ^	صخ^	سخ'^	خ'^	سخ^	خ^	خ^	xx
سش	سوش	سولش	صش	صش	سش'	ش'	سش	ش	ش	y [j]
سش^	سوش^	سولش^	صش^	صش^	سش'^	ش'^	سش^	ش^	ش^	yy
س//ز	سور//ز	سولز	ص//ز	ص//ز	س//ز'	ز//'	س//ز	ز//	ز//	z [z] ()

5. Unicode Character Properties

10D40;GARAY DIGIT ZERO;Nd;0;AN;;0;0;0;N;;;;;
10D41;GARAY DIGIT ONE;Nd;1;AN;;1;1;1;N;;;;;
10D42;GARAY DIGIT TWO;Nd;2;AN;;2;2;2;N;;;;;
10D43;GARAY DIGIT THREE;Nd;3;AN;;3;3;3;N;;;;;
10D44;GARAY DIGIT FOUR;Nd;4;AN;;4;4;4;N;;;;;
10D45;GARAY DIGIT FIVE;Nd;5;AN;;5;5;5;N;;;;;
10D46;GARAY DIGIT SIX;Nd;6;AN;;6;6;6;N;;;;;
10D47;GARAY DIGIT SEVEN;Nd;7;AN;;7;7;7;N;;;;;
10D48;GARAY DIGIT EIGHT;Nd;8;AN;;8;8;8;N;;;;;
10D49;GARAY DIGIT NINE;Nd;9;AN;;9;9;9;N;;;;;
10D4A;GARAY VOWEL SIGN A;Lo;0;R;;;;;N;;;;;
10D4B;GARAY VOWEL SIGN I;Lo;0;R;;;;;N;;;;;
10D4C;GARAY VOWEL SIGN O;Lo;0;R;;;;;N;;;;;
10D4D;GARAY VOWEL SIGN EE;Lo;0;R;;;;;N;;;;;
10D4E;GARAY VOWEL LENGTH MARK;Lo;0;R;;;;;N;;;;;
10D4F;GARAY SUKUN;Lo;0;R;;;;;N;;;;;
10D50;GARAY CAPITAL LETTER A;Lu;0;R;;;;;N;;;10D70;
10D51;GARAY CAPITAL LETTER CA;Lu;0;R;;;;;N;;;10D71;
10D52;GARAY CAPITAL LETTER MA;Lu;0;R;;;;;N;;;10D72;
10D53;GARAY CAPITAL LETTER KA;Lu;0;R;;;;;N;;;10D73;
10D54;GARAY CAPITAL LETTER BA;Lu;0;R;;;;;N;;;10D74;
10D55;GARAY CAPITAL LETTER JA;Lu;0;R;;;;;N;;;10D75;
10D56;GARAY CAPITAL LETTER SA;Lu;0;R;;;;;N;;;10D76;
10D57;GARAY CAPITAL LETTER WA;Lu;0;R;;;;;N;;;10D77;
10D58;GARAY CAPITAL LETTER LA;Lu;0;R;;;;;N;;;10D78;
10D59;GARAY CAPITAL LETTER GA;Lu;0;R;;;;;N;;;10D79;
10D5A;GARAY CAPITAL LETTER DA;Lu;0;R;;;;;N;;;10D7A;
10D5B;GARAY CAPITAL LETTER XA;Lu;0;R;;;;;N;;;10D7B;
10D5C;GARAY CAPITAL LETTER YA;Lu;0;R;;;;;N;;;10D7C;
10D5D;GARAY CAPITAL LETTER TA;Lu;0;R;;;;;N;;;10D7D;
10D5E;GARAY CAPITAL LETTER RA;Lu;0;R;;;;;N;;;10D7E;
10D5F;GARAY CAPITAL LETTER NYA;Lu;0;R;;;;;N;;;10D7F;
10D60;GARAY CAPITAL LETTER FA;Lu;0;R;;;;;N;;;10D80;
10D61;GARAY CAPITAL LETTER NA;Lu;0;R;;;;;N;;;10D81;
10D62;GARAY CAPITAL LETTER PA;Lu;0;R;;;;;N;;;10D82;
10D63;GARAY CAPITAL LETTER HA;Lu;0;R;;;;;N;;;10D83;
10D64;GARAY CAPITAL LETTER OLD KA;Lu;0;R;;;;;N;;;10D84;
10D65;GARAY CAPITAL LETTER OLD NA;Lu;0;R;;;;;N;;;10D85;
10D66;GARAY VOWEL SIGN E;Mn;230;NSM;;;;;N;;;;;
10D67;GARAY CONSONANT GEMINATION MARK;Mn;230;NSM;;;;;N;;;;;
10D68;GARAY COMBINING DOT ABOVE;Mn;230;NSM;;;;;N;;;;;
10D69;GARAY COMBINING DOUBLE DOT ABOVE;Mn;230;NSM;;;;;N;;;;;
10D6A;GARAY CONSONANT NASALIZATION MARK;Mn;230;NSM;;;;;N;;;;;
10D6B;GARAY PLUS SIGN;Sm;0;R;;;;;N;;;;;
10D6C;GARAY MINUS SIGN;Sm;0;R;;;;;N;;;;;
10D6F;GARAY REDUPLICATION MARK;So;0;R;;;;;N;;;;;
10D70;GARAY SMALL LETTER A;Ll;0;R;;;;;N;;;10D50;;10D50
10D71;GARAY SMALL LETTER CA;Ll;0;R;;;;;N;;;10D51;;10D51
10D72;GARAY SMALL LETTER MA;Ll;0;R;;;;;N;;;10D52;;10D52
10D73;GARAY SMALL LETTER KA;Ll;0;R;;;;;N;;;10D53;;10D53
10D74;GARAY SMALL LETTER BA;Ll;0;R;;;;;N;;;10D54;;10D54
10D75;GARAY SMALL LETTER JA;Ll;0;R;;;;;N;;;10D55;;10D55
10D76;GARAY SMALL LETTER SA;Ll;0;R;;;;;N;;;10D56;;10D56
10D77;GARAY SMALL LETTER WA;Ll;0;R;;;;;N;;;10D57;;10D57
10D78;GARAY SMALL LETTER LA;Ll;0;R;;;;;N;;;10D58;;10D58
10D79;GARAY SMALL LETTER GA;Ll;0;R;;;;;N;;;10D59;;10D59
10D7A;GARAY SMALL LETTER DA;Ll;0;R;;;;;N;;;10D5A;;10D5A
10D7B;GARAY SMALL LETTER XA;Ll;0;R;;;;;N;;;10D5B;;10D5B
10D7C;GARAY SMALL LETTER YA;Ll;0;R;;;;;N;;;10D5C;;10D5C
10D7D;GARAY SMALL LETTER TA;Ll;0;R;;;;;N;;;10D5D;;10D5D
10D7E;GARAY SMALL LETTER RA;Ll;0;R;;;;;N;;;10D5E;;10D5E
10D7F;GARAY SMALL LETTER NYA;Ll;0;R;;;;;N;;;10D5F;;10D5F
10D80;GARAY SMALL LETTER FA;Ll;0;R;;;;;N;;;10D60;;10D60
10D81;GARAY SMALL LETTER NA;Ll;0;R;;;;;N;;;10D61;;10D61
10D82;GARAY SMALL LETTER PA;Ll;0;R;;;;;N;;;10D62;;10D62
10D83;GARAY SMALL LETTER HA;Ll;0;R;;;;;N;;;10D63;;10D63
10D84;GARAY SMALL LETTER OLD KA;Ll;0;R;;;;;N;;;10D64;;10D64
10D85;GARAY SMALL LETTER OLD NA;Ll;0;R;;;;;N;;;10D65;;10D65

10D40**Garay****10D8F**

	10D4	10D5	10D6	10D7	10D8
0	o	o	o	o	o
1					
2	l	l	l	l	l
3	z	z	z	z	z
4	z	z	z	z	z
5	o	o	o	o	o
6	o	o	o	o	
7	o	o	o	o	
8	o	o	o	o	
9	p	p	p	p	
A	/	/	/	/	
B	\	\	\	\	
C	,	,	,	,	
D	s	s		s	
E	-	-		-	
F	c	c	x	c	

Obsolete letters are highlighted in yellow.

Digits

10D40	○	GARAY DIGIT ZERO
10D41		GARAY DIGIT ONE
10D42	/	GARAY DIGIT TWO
10D43	⚡	GARAY DIGIT THREE
10D44	⚡	GARAY DIGIT FOUR
10D45	♀	GARAY DIGIT FIVE
10D46	♁	GARAY DIGIT SIX
10D47	♁	GARAY DIGIT SEVEN
10D48	♁	GARAY DIGIT EIGHT
10D49	♁	GARAY DIGIT NINE

Vowel signs

10D4A	/	GARAY VOWEL SIGN A
10D4B	\	GARAY VOWEL SIGN I
10D4C	，	GARAY VOWEL SIGN O
10D4D	，	GARAY VOWEL SIGN EE
10D4E	—	GARAY VOWEL LENGTH MARK
10D4F	c	GARAY SUKUN

Capital consonant letters

10D50	ᮁ	GARAY CAPITAL LETTER A
10D51	ᮂ	GARAY CAPITAL LETTER CA
10D52	ᮃ	GARAY CAPITAL LETTER MA
10D53	ᮄ	GARAY CAPITAL LETTER KA
10D54	ᮅ	GARAY CAPITAL LETTER BA
10D55	ᮆ	GARAY CAPITAL LETTER JA
10D56	ᮇ	GARAY CAPITAL LETTER SA
10D57	ᮈ	GARAY CAPITAL LETTER WA
10D58	ᮉ	GARAY CAPITAL LETTER LA
10D59	ᮊ	GARAY CAPITAL LETTER GA
10D5A	ᮋ	GARAY CAPITAL LETTER DA
10D5B	ᮌ	GARAY CAPITAL LETTER XA
10D5C	ᮍ	GARAY CAPITAL LETTER YA
10D5D	ᮎ	GARAY CAPITAL LETTER TA
10D5E	ᮏ	GARAY CAPITAL LETTER RA
10D5F	ᮐ	GARAY CAPITAL LETTER NYA
10D60	ᮑ	GARAY CAPITAL LETTER FA
10D61	ᮒ	GARAY CAPITAL LETTER NA
10D62	ᮓ	GARAY CAPITAL LETTER PA
10D63	ᮔ	GARAY CAPITAL LETTER HA

Obsolete capital letter shapes

10D64	ᮕ	GARAY CAPITAL LETTER OLD KA
10D65	ᮖ	GARAY CAPITAL LETTER OLD NA

Garay diacritical marks

10D66	◌̣	GARAY VOWEL SIGN E
10D67	◌̤	GARAY CONSONANT GEMINATION MARK
10D68	◌̥	GARAY COMBINING DOT ABOVE

10D69	◌̈	GARAY COMBINING DOUBLE DOT ABOVE
10D6A	◌̃	GARAY CONSONANT NASALIZATION MARK
10D6B	+	GARAY PLUS SIGN
10D6C	-	GARAY MINUS SIGN
10D6D		(Reserved)
10D6E		(Reserved)
10D6F	x	GARAY REDUPLICATION MARK

Small consonant letters

10D70	ɿ	GARAY SMALL LETTER A
10D71	ɿ̃	GARAY SMALL LETTER CA
10D72	ɿ̂	GARAY SMALL LETTER MA
10D73	ɿ̄	GARAY SMALL LETTER KA
10D74	ɿ̆	GARAY SMALL LETTER BA
10D75	ɿ̇	GARAY SMALL LETTER JA
10D76	ɿ̈	GARAY SMALL LETTER SA
10D77	ɿ̉	GARAY SMALL LETTER WA
10D78	ɿ̊	GARAY SMALL LETTER LA
10D79	ɿ̋	GARAY SMALL LETTER GA
10D7A	ɿ̌	GARAY SMALL LETTER DA
10D7B	ɿ̍	GARAY SMALL LETTER XA
10D7C	ɿ̎	GARAY SMALL LETTER YA
10D7D	ɿ̏	GARAY SMALL LETTER TA
10D7E	ɿ̐	GARAY SMALL LETTER RA
10D7F	ɿ̑	GARAY SMALL LETTER NYA
10D80	ɿ̒	GARAY SMALL LETTER FA
10D81	ɿ̓	GARAY SMALL LETTER NA
10D82	ɿ̔	GARAY SMALL LETTER PA
10D83	ɿ̕	GARAY SMALL LETTER HA

Obsolete small letter shapes

10D84	ɿ̖	GARAY SMALL LETTER OLD KA
10D85	ɿ̗	GARAY SMALL LETTER OLD NA

Acknowledgment

This project was made possible in part by a grant from the U.S. National Endowment for the Humanities, which funded the Universal Scripts Project (PR-268710-20, part of the Script Encoding Initiative at UC Berkeley) in respect of the Garay encoding. Any views, findings, conclusions or recommendations expressed in this publication do not necessarily reflect those of the National Endowment for the Humanities.

References

Dalby, David. 1966. "Further Indigenous Scripts of West Africa: Manding, Wolof, and Fula Alphabets and Yoruba 'Holy' Writing," *African Language Studies* 10: 161–181.