

A Roadmap to the Extension of the Ethiopic Writing System Standard Under Unicode and ISO-10646

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Introduction

This paper presents an overview of the areas of the Ethiopic writing system that will be addressed in forthcoming proposals from the Ethiopian national standards body to specify an “Extended Ethiopic” range in the Unicode 3.0 and ISO/IEC 10646 Basic Multilingual Plain standards. The term “extension” is used herein with respect to the existing joint standard which itself will be referred to as “Basic Ethiopic”. “Extension” *should not* be taken to infer that the proposals intend to offer newly derived elements of writing for speech and punctuation.

In the last section of this paper, however, true extensions to the writing system to better facilitate traditional practices with electronic publishing will be presented and discussed.

The extension of the Ethiopian writing system should be understood as a continual process with new elements emerging within the frequency of a decade. The arrival of new characters rarely, if ever, has occurred in the light of public view or from a central authority with a consensus agreement behind it as was witnessed with the “Euro” sign in Europe recently. In Ethiopia new elements are born in the heart of their user community and will represent a local and not national need and interest. Thus new elements do not necessarily spread across linguistic boundaries and into the orthographies of neighboring communities, returning ultimately into the “national orthography” as used in the federal government and school systems. Present standardization efforts are aimed at surveying, consolidating and encoding those extensions that clearly have been in use for an extended period at the regional levels as well as by special interests groups such as the Ethiopian Orthodox Church.

To better understand the nature of the Ethiopia’s still evolving script begins with an understanding of the dynamic linguistic and socio-economic setting that is Ethiopia.

Why Extended Ethiopic?

The amalgam of proposals that became Unicode UTC-95-055A (and ultimately lead to ISO-10646 Amendment 10) considered only four Ethiopian languages specifically; Amharic, Tigrigna, Oromigna and Bilin. Groups working on the various proposals were indeed aware of other characters. In particular Chaha, now called Sebatbiet, was discussed. However, encoding of these characters was put off until comprehensive information could be obtained to qualify their use.

In modern day Ethiopia and Eritrea a minimum of 88 native languages are spoken. This figure is sometimes quoted as high as 100 and even greater. There is disagreement at the present time among linguists over whether a “language” is truly an independent language or no more than a dialect member in a local language family. Table 1 presents 90 languages of the region.

Table 1: 1996 Ethnologue¹ Table of Ethiopian and Eritrean Languages

Cushitic (30)		Ethio-Semitic (12)		Nilo-Saharan (21)		Omotic (27)	
L	Afar (Dankali) ^{Er}	E ^{GX}	Amharic		Anfillo	E	Aari
E ^{GX}	Agaw		Argoba	L ^G	Anuak		Bambassi
	Alaba	E ^X	Ge'ez ^{1 Er}		Berta		Basketto
	Arbore	E ^{GX}	Gurage, (Chaha)		Gobato	E ^X	Bench
	Awngi	E ^G	Gurage, (Silte)	E	Gumuz		Boro
	Baiso	E ^G	Gurage, (Sodo)		Kacipo-Balesi		Chara
	Bedawi	E ^G	Harari	E/L	Komo		Dime
L	Beja ^{Er}		Mesmes ¹	L	Kunama (Baza) ^{Er}		Dizi
E ^X	Bilen ^{Er}	E	Sekota		Kwama		Dorze
	Birale	E ^G	Tigre ^{Er} (Bedo)		Kwegu	L ^G	Gamo-Goffa- Dawro
	Burji	E ^G	Tigrigna ^{Er}	E	Majang		Ganza
	Busa		Zay	E ^X	Me'en	E	Hammer-Banna
	Daasanech				Murle		Hozo
	Dirasha				Mursi		Kachama
	Gawwada			L	Nara ^{Er}	L ^G	Kaficho
L ^G	Gedeo				Nuer		Karo
L ^G	Hadiyya				Nyangatom	E/L	Koorete
L ^G	Kambaata				Opuuo	E	Male
E ^G	Kebena				Shabo		Melo
E	Komso			E	Suri		Nayi
	Kunfal			L	Uduk		Oyda
	Libido						Seze
L ^G	Oromo, (Borana-Arusi- Guji)					L ^G	Shakacho
L ^G	Oromo, (Western-Central)						Sheko
L ^G	Oromo, (Qotu)					L ^G	Wolaytta
L	Saho ^{Er}						Yemsa
L ^G /E ^X	Sidamo						Zayse-Zergulla
L ^G	Somali						
	Tsamai						
	Xamtanga						
E Using Ethiopic script. L Using Latin script.		G Information is from a government source. X Requires Ethiopic Extensions.			I Language is now extinct. Er Eritrean (Also or Only).		

Within Table 1 “E” and “L” indicate the script(s), Ethiopic and Latin respectively, known to be in use by the representative peoples. This is *not* to imply that other groups are not using any writing system at all or that Latin is in exclusive use. Unmarked languages are in all likelihood using Ethiopic and the Summers Institute of Linguistics who has produced the table has not yet investigated or confirmed the usage. Groups using Latin will have certainly used Ethiopic prior to a move to Latin by their regional governments. Arabic use is not indicated in the table but indeed it is important in Ethiopia and is an official language of Eritrea. Interestingly, Arabic script is used to scribe Amharic in the Wello province in a practice known as “Ajjam”.

An unknown number of peoples are using Ethiopic for Amharic, Ethiopia’s lingua-franca, but are not publishing in their own language or writing in their own language beyond the composition of limited personal notes. As these societies’ need for producing literature in their own languages grows in the coming years they will begin to address more carefully their linguistic needs and how well supported they are by the Ethiopic writing system.

Some may elect to extend the consonants and vowels of the writing system (the Agaw have done this and the Me'en are considering the same) or to recycle redundant syllabic series within the writing system (notably the Aari and Timirin have done this). Finally others may decide that the Latin script is a better choice for their language as many of the Cushitic groups have done in recent years (ala Qubee and Wogagoda).

Extension Standardization Activity in Ethiopia

In response to the Unicode Consortium's proposal, work began within Ethiopia on the extended standard in 1996 by informal collection of writing elements at the Academy of Ethiopian Languages and National Computer and Information Center. Formal work was undertaken in late 1997 and throughout 1998 by the Ethiopian Computer Standards Association (ECoSA).

The formalized process ECoSA has followed to obtain extension elements has been to visit and collect literature from:

1. Education Materials Production and Distribution Agency to collect those elements used in the school system.
2. The Institute of Ethiopian Studies to collect elements used in pre-20th century literature.
3. Regional administrative bureaus indicating office use of Ethiopic script within the Ethiopian government.
4. Missionary groups and Bible publishing agencies engaged in multilingual translations of religious materials.
5. Individual contact with members of the education, sectarian, linguistic and publishing communities.

A workshop was conducted by ECoSA and hosted at the Quality and Standards Authority of Ethiopia (QSAE) on July 4th 1998 that presented the work collected by the time of the conference. Open discussion was held on the materials presented and issues relative to standardization of the writing system.

Participants did fill in information gaps and work on the collection of extended elements has continued into the first half of 1999. A notable milestone in the course of the 1998 work was the composition of the initial draft proposal for Ethiopic Extensions in ISO/IEC N 1846. During the second half of 1999 ECoSA will submit a conclusive report to the QSAE to establish a national standard for the writing system. The QSAE in turn will offer the new elements to external standards organizations.

Extension Mechanisms

The "Basic" Ethiopic syllabary as defined in Unicode 3.0 is a series of 37 consonants each having at least 7 syllables, most having an 8th form that is a diphthong, and 6 series having a complete set of 5 diphthongs. Among the 7 syllables 3 (the 2nd, 3rd and 5th) are denoted by diacritic marks that are attached to the base of the first form syllable (considered the natural state of the glyph). Two syllable forms (the 4th and 7th) are denoted by the shortening of all but one "leg", the addition of a "leg", or slanting of a "leg". The 6th form, which corresponds directly to a consonant, more often than not is given a "crick" to a vertical line on the element's left side. Diacritic marks are also applied to rendered the five diphthongs. An example is illustrated in the following table for the complete family of 12 syllables in "kə":

Table 2: Forms of Ethiopic Syllables

Name	Ge'ez	Ka'eb	Salis	Rab'e	Hamis	Sadis	Sab'e	Dikala Ge'ez	Dikala Ka'eb	Dikala Rab'e	Dikala Hamis	Dikala Sadis
Letter	ከ	ከ·	ከ.	ከ	ከ።	ከ	ከ	ከ።	ከ።	ከ።	ከ።	ከ።
Sound	kə	ku	ki	ka	ke	k	ko	k ^{wə}	k ^{wi}	k ^{wa}	k ^{we}	k ^w

Diacritic marks are always attached and always used to modify the vowel and not the consonant component of a character. The diacritic marks are not considered independent symbols in the Ethiopic syllabary (though some

encoding techniques apply this to fit the syllabary into the limited space of a computer font) and syllables are unequivocally thought of as “whole” and in no way a sum of parts. These are loose rules of how syllabification occurs orthographically and many consonant series will not abide by all or some of these rules (about 30%). When new characters are derived however, these rules are concrete enough that the marks will be deployed.

When new consonants need be derived there is an accepted practice that came out of the six palatal extensions made for the Amharic language in the 16th century. The marker applied then was the “butterfly” bar, ‘[˘]’, placed above corresponding dental syllables (ታ ⇒ ት[˘]). The approach has since been applied to another seven syllables for the phonemes of other languages and has become a general modifier and not necessarily a palatalizer. The ‘[˘]’ and ‘[˙]’ marks have been used more recently when conflicts might have occurred with ‘[˘]’.

Areas of Extended Ethiopic

The composition and submission of extension proposals in Ethiopia is following the path of the most immediate requirements for communication and publishing of the respective peoples and industries. These prioritized needs follow the natural boundaries within the writing system:

Syllables

Elements of Ethiopic script used to write words in one’s language.

Punctuation and Symbols

Elements used to augment word boundaries, having iconic meaning, or used to modify the spoken value of a syllable or word.

Historic

Elements not in present day use but essential to the preservation of historic materials.

Auxiliary

Elements for advanced electronic typesetting that may represent only a partial character.

Syllables

By far the most important writing elements for inter-personal communication in the Ethiopic syllabary are those used to record the spoken word. Not waiting for standards to emerge the communities left unserved by existing standards for Ethiopic have begun publishing with proprietary systems. ISO/IEC JTC1/SC2/WG2 N 1846 proposes a character set extension for four communities.

Sebatbiet (Chaha) Guragigna

Extensions in Sebatbiet in ISO/IEC N 1846 were for the four palatalized velars, ቀ, ከ, ኸ and ገ, plus additional labializations. Palatalization is indicated with a simple ‘[˘]’ like mark placed above the base forms as per: ገ + [˘] = ገ[˘].

ቀ [˘] ቀ [˘] ቀ [˘] ቃ [˘] ቆ [˘] ቆ [˘]	ከ [˘] ከ [˘] ከ [˘] ካ [˘] ኬ [˘] ኸ [˘]
ኸ [˘] ኸ [˘] ኸ [˘] ካ [˘] ኬ [˘] ኸ [˘]	ገ [˘] ገ [˘] ገ [˘] ገ [˘] ገ [˘] ገ [˘]

Four groups of rounded labials, መ, በ, ፈ, and ፐ, are velarized with the existing velarizing diacritic marks:

መ [˘] መ [˘] ማ [˘] ማ [˘] ም [˘] ም [˘]	በ [˘] በ [˘] ቡ [˘] ቡ [˘]
ፈ [˘] ፈ [˘] ፈ [˘] ፍ [˘]	ፐ [˘] ፐ [˘] ፐ [˘] ፐ [˘]

“Nowadays phoneticians are fond of interpreting Tebek as "geminated"; the more popular manuals have always used the less pretentious expression "doubled". But neither word adequately describes the phenomenon, wherein the consonant is "strengthened" or "dwelt upon" rather than repeated: Ambruster's example of the sound of 'f' in "off fur" as compared with "offer" is a good illustration.”²⁸


Tebek is primarily of use in linguistic works, dictionaries, and material aimed at language education. In less common cases a single dot might be used or the marks are put beneath letters rather than above. In these instances the variation on Tebek may have occurred due to a typographic limitation where the more common Tebek could not have been used.

Circular variants of Tebek are indeed graphically similar to “Non-Spacing Diaeresis” (U+0308), but the similarity ends there. Semantically the two are not interchangeable.

Ethiopic Sarcasm Mark “Temherte Slaq”

Graphically indistinguishable from U+00A1 (i) Temherte Slaq differs in semantic use in Ethiopia. Temherte Slaq will come at the end of a sentence (vs at the beginning in Spanish use) and is used to indicate an unreal phrase, often sarcastical in editorial cartoons. Temherte Slaq is also important in children's literature and in poetic use. Debate is needed among Ethiopian scholars to determine if inverted exclamation mark is acceptable.

Ethiopic Registered Sign “Yeneged Meleket”

It has only been in the last 2 years that Ethiopia has begun protecting intellectual property by the issuing of patents and joining the international copyright convention. Coming out of this, as the society becomes familiarized with the new laws, has been the emergence of the “Yeneged Meleket” symbol “”. Meleket is used interchangeably at this time with the Western ®, © and ™ in bilingual advertising.

Ethiopic Tonal Marks “Zaima Meleketoc”

The Ethiopian Orthodox Church uses a collection of nine additional symbols to stress tones when music is sung in the “Zaima” practice. It is a misnomer to refer to the symbols as “music notes” as they are not in any way used to record and recite sequences on any musical instrument.

The collection of roughly 150 notations are collectively known as "Yaredawi YeZaima Meleketoc" and contain the set of the 20 Ethiopic numerals (often sans the lower line), 121 abbreviated words and the 9 unique symbols already mentioned^{36,42}. The symbols are used on three rows above a line of text. Each row (from bottom upward formally named: Ge’ez, Ezel and Araray) indicates how the passages are to be voiced during different ceremonies. The 9 unique symbols are presented in the following table:

Table 3: The 9 Unique Glyphs of the St. Yared’s Zaima Notation

ገ̇	ይዘት (Yizet)	stresses letter
ገ̈	ደረት (Deret)	stresses closing (chestic)
ገ̋	ርክርክ (Rikrik)	rising and rising
ገ̌	ደፋት (Difat)	falling voice
ገ̍	ቅናት (Kenat)	rising voice
ገ̎	ቅረት (Chiret)	ቅናት when used beside other notes
ገ̏	ከደት (Hidet)	sound is not voiced
ገ̐	ደረት ከደት (Deret Hidet)	unstressed and continuing
ገ̑	ቁርጥ (Kurt)	sound is swallowed

The symbols are essential to Ethiopian Orthodox Church processional traditions and are printed in books by modern day printing presses within Ethiopia.

Historic

An important class within the Ethiopic syllabary are those characters no longer in present day use but fundamental to Ethiopian writing in previous periods and essential to the preservation of older works of literature.

Ethiopic Ligatures

Ethiopian ligatures are still alive and well in the Orthodox Church calligraphic practices. Once this was the predominant form of Ethiopic text but is now dwarfed in volume by the mass-produced automated publishing of the modern media.

It has been suggested directly and indirectly in a number of works that the Diqala-Rab'e form of Ethiopic syllographs originated as a shorthand for the common occurrence in Amharic of 6th form syllograph followed by **ዋ** (the female definite and possessive article) as follows: **ዎ** + **ዋ** = **ዎዋ**. Ambruster²⁹, Cohen²² and Dawkins²³ indicate this for U+1358, U+1359 and U+135A as well: **ረ** + **ዖ** = **ረዖ** which are common sequences in Amharic instrumental nouns. Only the labialized characters in the former case have survived into the present day though no longer thought of as ligatures.

Any numbers of ligatures are possible for Ethiopic but none are used in modern publishing practices. In pre-20th century ecclesiastical writing the authors have found that most scribes will use ligatures at every opportunity - which plausibly was a means to conserve both ink and Brana.

Ligatures used then seem to have been dependent on the training the individual scribe had received. There are however a common set of ligatures used by different scribes in different regions and periods of time. A general rules appears to have been to join any two nearly vertical lines that would be adjacent in a word and to join the loop in the 5th form diacritic mark with the rear loop of U+120D (**ል**).

አዊሊብኤብረኤልዎዎ

The above ligatures are presented for informative purposes at this time. A prerequisite for any proposal to encode ligatures must follow a comprehensive survey of the ligatures in present and ancient literature. No such effort has been initiated at this time.

It does appear however that two particular ligatures do appear most commonly. These two are **አል** and **ዊሊ አል** being a Hebrew form of “God” occurs regularly in proper nouns; “Israel”, “Samuel”, “Michael”, and “Daniel” for instance. **ዊሊ** appears as the 2nd and 3rd letters in the name of “God” in Ethiopian languages and likewise is very frequent in the Bible and like literature.

Italian Transcription

In the mid 17th century three syllabic series were introduced for the transcription of Italian in Ethiopic writing. The only surviving series into the present day are those in “ve” (**ቨ**) U+1268-U+126F. The others are syllograph series in “gl” and “mya”:

ሸሸ-ሸ ሸሸሸሸ **ሙሙ-ሚ ሚሚሚሚ**

It is conceivable that members in the series in **ሙ**, particularly the 3rd and 4th forms, survived as the variants known for both U+121F (**ሚ**) and U+1358 (**ሚ**).

Ethiopic Extensions for Sidama

The Ethiopian Languages Academy (now the Ethiopian Languages Research Center) during a 1980s literacy campaign introduced four new series for the orthography of the Sidama language (aka Sidamigna)³². The four glottal series are shown below:

ሸሸ-ሸ ሸሸሸሸ **መመ-ሚ ሚሚሚሚ**
ረረ-ሪሪ-ሬሬሬሬ **ኘኘ-ኘ ኘኘኘኘ**

The Sidama have abandoned Ethiopic for Latin in recent years. It is not known at the present time if any significant publications, other than popularization materials of the literacy campaign itself, were ever produced using the Sidama syllographs.

Pre-Syllabic Orthography

Prior to the syllabification of the Ethiopian (then Ge'ez) script in the 4th century A.D., the alphabetic letters were written in right-to-left fashion as well as in the alternating “plow style”. When writing conventions standardized on the left-to-right preference the glyphs of a few letters were effected. Scholars may find the need to have “Ancient Ethiopic” independently encoded or may elect to use an alternative Ethiopic typeface. This area of standardization of historic orthography awaits discussion in Ethiopia.

Auxiliary Symbols

With advanced electronic typesetting capability made possible by software such as T_EX and L^AT_EX and the Unicode based follow-ups Omega and Lambda, publishers may wish to introduce new glyphemes to better reproduce traditional texts. Presented in this section are text elements that may not be appropriate in the alphabetic ranges and will likely be relegated to the private use range. A standard might later be set in the Ethiopic software community to standardize the use of the private use zone to maintain the interchangeability issues that Unicode is here to solve.

Ethiopicized Punctuation

A defining feature of Ethiopic script that is immediately apparent to the new observer is the greater weight at which the characters are rendered relative to other systems of writing. More subtly, the absence of straight lines and sharp angles is another definitive feature of the script.

It is not surprising then that when punctuation is borrowed from western writing practices that they be reshaped to comply with the rules of weighting and curvature in Ethiopic practices. The result is a more natural and aesthetically pleasing presentation of text. Most Ethiopic font vendors will “Ethiopicize” western punctuation and numerals and publishers in Ethiopia will insist on it.

The Monotype⁴³ Ethiopic font presents particularly well done examples:

Table 4: Ethiopicized Punctuation by Monotype

!	‘	’	“	”	«	»	.	?
---	---	---	---	---	---	---	---	---

Since the Ethiopicized glyphs then look unnatural in a non-Ethiopic block of text the author would revert to the typeface appropriate to match his punctuation with text. In a Unicode setting where both Roman and Ethiopic scripts are available in a single font, switching typefaces merely for punctuation imposes a burden on the user. Ethiopic font vendors using Roman and Ethiopic scripts in a single font will likely wish then to place Ethiopicized punctuation in the “Private Use” zone of Unicode. This indeed has been the case since 1996 with the Multilingual Emacs Ethiopic font in Unicode⁴⁴.

Numerals

Ethiopic and Roman numerals are derived from the letter elements of their respective writing systems and exhibit the distinctive feature of the horizontal line above and below the central glyph. Without which there would be no visual distinction between some number of the numerals and their letter form counterparts (7 occurrences in Ethiopic versus all for Roman). Given the similarities between the numeral systems it should come as no surprise that in adjacent numbers the horizontal bars framing the central glyphs will be joined in hand written and premier quality publishing practices.

In Example:

፲፱፻፺፩ (the current Ethiopian year, 1991) becomes ፲፱፻፺፩

To facilitate the automation of rendering any sequence of Ethiopic numerals in capable typesetting software, it would be advantageous to encode the central glyphs (e.g. ፩, ፪, ፫), the framing bars (፬), and perhaps even the bar components, as independent character codes. The framing bars are also applied above and below letters in older practices when letters are used for ordered list items⁴².

Interlaced Colorization

A practice in Ethiopic ecclesiastical writing is to emphasize holy and sacred words with the color red as is common also in the west. An extension to this practice is particular to Ethiopic punctuation, most notably for Ethiopic Full Stop (⌘, U+1362) where the sign of the crucifix ⌘ decorates the empty spaces to form ⌘. The practice is also common for Ethiopic Comma, Semicolon and Numerals (e.g. ፡, ፣ and ፤).

While rendering red text presents no particular challenge to today's software the rendering of interlaced red text deserves a little more attention. Our construction: ⌘, is composed of an enlarged version of U+1362 followed immediately by a non-spacing 5-dot ⌘ character that does not exist on its own in the Ethiopic writing system. The colorized numerals apply the framing bars (⌘) as a non-spacing glyph. The independent encoding of these glyphs is recommended as a pragmatic means to render the composite character with the expected colorization.

Diacritical Marks

As computer use grows amongst linguists in Ethiopia the desire is emerging to have the Ethiopic diacritical symbols independently encoded as part of an Ethiopic phonetic symbology⁴⁵. Independently encoded diacritic marks would also serve the present day publishing needs of adolescent education materials.

Conclusion

The Unicode 3.0 standard for Ethiopic script does indeed satisfy the modern day needs of the overwhelming mass of Ethiopic text being published and electronically exchanged today. Standardization activity in Ethiopia will continue to address the remaining needs of local and special interest publishing practices to facilitate the migration to electronic publishing and information interchange.

It should be kept in mind that Ethiopia has a very rich, deep and diverse history of writing practices. Writing traditions that will continue to grow and diversify as Ethiopia further enters the global economy and as Ethiopian society accelerates its modernization amongst the peoples of its varied linguistic topology. In this light, standardization of the Ethiopic script should then be anticipated as an on-going and long-term process.

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