A Morse Code for the Amharic Language

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SUMMARY

A Morse-Code for the Amharic Language is hereby proposed which shall replace the international English-Code so far used by the Imperial Board of Telecommunirations of Ethiopia (I.B.T.E.) for internternal Amharic messages.

The proposed code will enable to speed-up the transmission of telegraphic messages in Amharic, by improving its "transmission-efficiency" and by reducing its' "error content".

INTRODUCTION

The Imperial Board of Telecommunications of Ethiopia uses at present the international English Morse-Code to handle telegraphic messages in Amharic, since no Amharic Morse- Code has been developed so far.

With the present practice, a poor efficency of transmission and a high error-content in the transmitted messages seem to be unavoidable due to the following reasons:

1. Telegram messages intended to be transmitted in Amharic have always first to be written in Latin characters, before any transmission is possible. At the "receiving end" the message must again be translated from its Latin characters into the Amharic alphabet.
   This procedure renders the system vulnerable to infiltration of error.
2. The relative statistical frequency of occurence of the individual letters in the Amharic language is not necessarily the same as in the corresponding relative frequency of occurrence of the English phonetic counterpart.

The most frequent Amharic letters are, therefore, usually represented. by inefficient symbols which in addition could, at times, be unnecessarily long.

GENERAL CONSIDERATIONS

In developing the Code some conflicting requirements and features have to be taken into consideration:

1. From the point of yew of efficiency of transmission alone, a completely new code should be developed, the statistical relative frequency of each letter in the Amharic alphabet being its only consideration. In this case the most frequent letters get the simple code-symbols. Such a code would, however, make the bi-lingual telegraph operations difficult. It would moreover result in error infiltrations since the same phonetic sounds could have completely different symbols in the two codes.
2. Basically the Morse-Code is a phonetic code, while the Amharic alphabet is a syllabic one. Some minor changes have therefore to be introduced into the Amharic alphabet, by which its phonetic, rather than its syllabic, structure shall be emphasized, thereby adapting it for translation into a Morse-Code.

Those changes however shall be small enough to allow the preservation of the structure of the alphabet.

In the Amharic alphabet, although the symbols stand for syllables each syllable starts with a consonant, the vowel always following. This fact could be be used to advantage in formulating a Morse-Code.

DESIGN PROCEDURE

To find a practical solution for all those conflicting requirements, the procedure adopted in designing the code was as follows:

1. The symbols for the Amharic letters will, whenever feasible, be the same as their closest phonetic counterpart in the English alphabet. This will facilitate the training of bilingual (Amharic-English) operators, diminishing at the same time the possible error content of the messages transmitted.
2. In assigning additional symbol for the particular Amharic sounds which do not exist in the English alphabet, their relative frequency of occurrence will be taken into con-

sideration. To do so, the research paper prepared by Asmarom Legesse and others could be used.

Table I (Extracted from this paper) gives the relative frequency of occurrence of the various syllabic forms in the language, while Table II accentuates the relative frequency of occurrence of its vowels.

3. Each symbol will represent an Amharic letlet as used in the first (ግዕዝ) class. The vowel involved with this syllabic form, will not have to be represented, the same symbol standing for the consonant alone and/or for the syllabic form of the first class.

   Table I shows that it would have been more efficient to use the sixth (ሳድስ) form, which is more frequent, as the basic one, but this would have distorted somehow the nature of the code, thus tending for it to deviate too much from the structure of the language. The ግዕዝ form was therefore adopted as the basic one.

4. The particular syllabic classes will get separate symbols each of which will also stand for the corresponding vowel of the English alphabet. Those symbols will transform, at the reciving end, the basic first-class syllabic letter (after which they are received) into the one that correspond to the particular vowel-class they represent.

   At the sending end, each syllabic symbol will again be split before being transmitted into its basic (ግዕዝ) root, followed by the corresponding vowel class symbol.

These vowel symbols will, whenever possible also be made equal to their English counterpart. However the sixth class is the most frequent one in Amharic and it will be represented by the symbol of the English E-letter (although their rounds are not completely equivalent) due to efficiency considerations.

Because of the above procedure which involves splitting of syllables. The deciding of a consonant symbol at the receiving end has to bedelayed until the next symbol is received. If the second received symbol is a vowel-symbol, the combination may then be written following the usual symbolic notation, the vowel-class-symbol serving as a modifying order. However, if this second received symbol is a consonant again, the former symbol will first be written in its first class letter form, and the writing of the new consonant received next will be delayed until the next (third) symbol is received... etc., unless the fluent interpretation of the context permits the simple juxtaposition of the two consecutively received consonants

This one-letter delay procedure is the price paid for the preservation of the Amharic alphabet in its syllabic form.

5. All the diftongs letters, from the Amharic alphabet will receive no symbol and will therefore have to be synthesized from the vowels involved.
6. Amharic letters that have similar phonetic value (stand for similar sounds) will receive the same symbol, provided their mutual interchange does not affect the meaning of the words in which they may appear too much.
7. The symbols for Arabic figures and punctuations are carried over as they are in the English code.

CONCLUSIONS

On the basis of the above mentioned design procedure and taking in consideration the various conflicting requirements involved, a Morse-Code for the Amharic Language is hereby proposed as indicated in Table III below.

As an example, a practical sample of some fifty words encoded and decoded by using the proposed code is included in Table 4.

This encoding and decoding was done as a practical experiment by two different students of the Engineering College. The students had no previous training in the code, and have been told only the principles of the problem involved and briefed how to use Table III.

With the accomplishment of the work it will only be correct to add that no claim is made here about the proposed code as being perfectly designed, nor do we reject any further possibility of improvement which could arise during the practical use of it.

The main advantages which seem to us to make the introduction of the proposed code in Ethiopia worthwhile (as explained in more detail in the Introduction), are.

a. An increase in the "Transmission-efficiency" of Amharic messages.
b. A reduction in their error content.
c. A feeling of satisfaction for the sentiment of national pride in having an Ethiopian code.

REFERENCE

1.) Report on Amharic language by Asmaron Legesse & others (published in May 1965 in Addis Ababa by the Point Four Mission) available in the Library of the Institute of Ethiopian Studies, Addis Ababa, classification No. 430 ASM-15610).

TABLE I

	ነ	ተ	ለ	መ	በ	ሉ	የ	ረ	ወ	ሰ	ገ	ደ	ከ	ጠ	ቸ	ሀ	ዘ	ቀ	ሐ	ፈ	ሸ	ሠ	ኘ	ዐ	ጀ	ጨ	ፐ	ዝ	ደ	ኀ	ጸ	ፀ	ኸ	ድምር	ጐ	ጕ	ኵ	ቈ
ወፍራም : ድምፅ :	1	4	4	—	—	—	—	1	—	2	—	1	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—	—	—
ግዕዝ : *a*	41	62	73	76	94	100	64	24	44	33	41	48	56	35	19	1	12	21	6	17	6	7	2	4	5	4	—	—	—	—	—	—	—	895	—	5	—	—
ካዕብ : *u*	3	9	13	2	11	—	3	7	—	7	8	4	5	3	2	26	1	5	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	111	—	—	—	—
ሣልስ : *i*	1	4	—	20	3	—	—	13	2	21	15	5	1	—	—	—	24	4	1	3	—	—	—	—	—	—	—	1	—	—	—	—	—	118	—	—	—	—
ራብዕ : *a*	53	34	52	13	25	—	48	31	11	8	14	16	16	18	5	1	9	4	1	1	4	—	9	12	4	4	1	1	2	1	1	1	—	400	25	2	—	—
ሐምስ : *e*	10	4	4	7	15	—	—	4	—	4	2	2	1	1	4	1	14	—	21	1	1	—	—	—	3	—	—	—	—	—	—	—	—	100	—	—	—	—
ሳድስ : *i*	145	126	52	75	37	79	44	68	74	52	37	37	19	22	49	31	5	18	7	12	14	17	11	5	7	5	2	1	1	—	—	—	—	1052	—	—	—	—
ሳብዕ : *o*	5	8	3	6	1	—	5	10	7	—	1	1	—	6	—	12	—	3	—	—	—	—	2	—	4	1	1	—	—	—	—	—	—	76	—	—	—	—
ድምር :	259	251	201	199	186	179	164	158	138	127	118	113	98	86	79	72	64	55	37	36	25	24	24	23	23	14	4	3	3	1	1	1	0	2752	25	7	0	0
ማዕርግ :	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22.5	22.5	24.5	24.5	26	27	28.5	28.5	31	31	31						

TABLE II

CLASS	VOWEL	APPROXIMATE SOUND	FREQUENCY	PROPORTION OF TOTAL
1st	ግዕዝ ፡	ă (a)	895	0.33
2nd	ካብዕ ፡	u	111	0.04
3rd	ሣልስ ፡	i	118	0.04
4th	ራብዕ ፡	a	400	0.14
5th	ኀምስ ፡	e	100	0.04
6th	ሳድስ ፡	î (no vowel)	1052	0.38
7th	ሳብዕ ፡	o	76	0.03
			2752	1.00

PROPOSED CODE. TABLE III.

AMHARIC	phon. sign	SYMBOL	ENGLISH
* ሳድስ ፡	â	·	E +
* ራብዕ ፡	a	·—	A
ነ		—·	N
ተ		—	T
ለ		·—··	L
መ		——	M
በ		—···	B
አ/ዐ		··——	
የ		—·——	Y
ረ		·—·	R
ወ		·——	W
ሰ/ሠ		···	S
ገ		——·	G
* ሣልስ	i	··	I
ደ		—··	D
* ካዕብ	u	··—	U
ሐምስ	e	··—··	E
ከ		—·—	K
ጠ		··—···	
ቸ		————	CH
* ሳብዕ	o	———	O
ሀ/ሐ/ኀ/ኸ		····	H
ዘ		——··	Z
ቀ		——·—	Q +
ፈ		··—·	F
ሸ		·—·—·	SH
ኘ		—·—·—	
ጀ		·———	J

AMHARIC	phon. sign	SYMBOL	ENGLISH
ጨ		—···—	CH'
ፐ		·——·	P
ገ		·—·——	
ጸ/ፀ		—··—	X +
ጰ		·——··	
ቨ		···—	V *
		—·—·	C
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1		·————	1
2		··——	2
3		···——	3
4		····—	4
5		·····	5
6		—····	6
7		——···	7
8		———··	8
9		————·	9
0		—————	0
ስሕተት		·····	MISTAKE
		···—·	O. K.
መጨረሻ		·—·—	END

N.B. a) Dipthongs are to be made from individual vowels.
b) Amharic letters are arranged according to their decreasing relative frequency in the language.

* Vowel class.

\+ Not exactly equivalent.

TABLE IV

THE ENCODED AND DECODES FIFTY WORDS SAMPLE.

PART A.

ከኮሌጅ ፡ አየተመረቁ ፡ የሚወጡት ፡ ተማሪዎች ፡ ቁጥር ፡ በየጊዜው ፡ አየበረከተ ፡ ሲሔድ ፡ አንድ ፡ የሕንፃ ፡ ሥራ ፡ ድርጅት ፡ ተኮሌጅ ፡ ቁጥር ፡ ግቢ ፡ ውስጥ ፡ በ1953 ፡ ዓ ም ፡ ተቋቋመ ።

PART A IN CODE FORM.

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PART B.

ግርማዊ ፡ ንጉሠ ፡ ነገሥት ፡ ቀዳማዊ ፡ ኃይለ ፡ ሥላሴ ፡ በኪነ ፡ ጥበብ ፡ ትምህርት ፡ ቤት ፡ አዳራሽ ፡ ውስጥ ፡ ተዘጋጅቶ ፡ በኤክስፖዚስዮን ፡ መልክ ፡ የቀረበውን ፡ ኢትዮጵያን ፡ እንደ ምታይት ፡ የሚለውን ፡ የሥዕል ፡ ኤክስፖዚስዮን ፡ ትናንት ፡ ግን ቦት ፡ 20 ፡ ቀን ፡ ከቀትር ፡ በኋላ ፡ ጉብኝተዋል ።

PART B. IN,CODE FORM.

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