ASPECTS OF SOMALI TONOLOGY

by

Johan Frid.

Contents

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ASPECTS OF SOMALI TONOLOGY.

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INTRODUCTION.

This paper is about the phonology and phonetics of tone accents and related phenomena in present day Somali. Somali has an elaborated accent system, where tone is important, and the tonal characteristics of accents and boundary markers are studied through a series of recordings made by native Somali speakers. Facts about the Somali language are based partly on literature, partly on interviews with the informants. The aim of the study is to present an overview of Somali tonology and to examine some aspects of it in further phonetic detail.

PRESENTATION OF SOMALI.

Demography.

Somali is a language spoken by about 8,5 million speakers, mainly in the region of the Horn of Africa. It is the official language in the Republic of Somalia, and it is also spoken in some parts of the neighbouring countries Djibouti, Ethiopia, and Kenya. Civil war in Somalia in the 1980s and 1990s has caused major emigration, and therefore there also exist Somali-speaking communities in the Middle East, Europe, the USA, and Canada.

Somali is a Cushitic language, which in turn is a member of the Afroasiatic superfamily. Cushitic languages are found from the Red Sea coast to the Sudan-Ethiopia border, and extends into northern Kenya. There are about 40 different Cushitic languages, spoken by approximately 15 million people. The closest relatives to Somali are Rendille and Aweer (or Boni); both are spoken in Kenya.

Dialects.

A thorough study of Somali dialects is Lamberti (1986). Using 80 informants, he covers most of the varieties of the language, and almost all areas where it is spoken. His classification is based on phonological,

syntactical, and morphological similarities. Five major groups are distinguished (see map for their distribution):

(1) Northern Somali
(2) Benadiir
(3) Ashraaf
(4) May
(5) Digil

For a historical discussion of the development of Somali dialects, see Ehret & Ali (1984). In an earlier classification, Andrzejewski (1971) suggested three main groups:

(1) Common Somali
(2) Coastal Dialect
(3) Central Somali

These terms are still in use in the literature on Somali. Common Somali roughly corresponds to Northern, and Central Somali to May and Digil. Coastal, as the name suggests, is spoken along the Somalian coast.

Language situation in Somalia.

In 1972, Somali was declared the official language of Somalia. All administrative and educational work was thenceforth undertaken in the language. Even though some minority languages exist (e.g., Oromo, Swahili, and Mushungulu) Somali is the only language spoken throughout whole Somalia. Almost all citizens have knowledge of either Common Somali or a local dialect.

Common Somali is based on the northern dialect group and is used as a lingua franca and for broadcast and written media. When new words are needed for new ideas and objects, one tries to coin Somali-based forms. Borrowing is also common, mostly from Arabic, since the country has close ties with the Arab world through religion. The second most important language is Arabic, while the previous administrative languages Italian and English used to be taught, but it is difficult to confirm their statuses today, considering the present situation in the country.

Phoneme inventory and ortography.

Standard written Somali is primarily based on Common Somali, even though dialectal influence may affect some aspects of written usage. The written language uses the Roman alphabet and reflects the pronunciation quite accurately. The following symbols are used in the ortographic system of Somali (after Saeed 1987):

a b c d dh e f g h i j k kh l
m n o q r s sh t u w x y '

All vowels may be short or long. Long vowels are represented by doubling the relevant vowel symbol:

aa ee ii oo uu

In addition to the monophtongs, the following diphtongs occur:

ay aw ey oy ow

The following table shows what sounds the consonant symbols represent (deviations between orthographic and phonetic symbols [IPA] are given in brackets):

	Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Uvular	Phar-yngeal	Glottal
Plosive									
Voiceless			t			k	q		' [ʔ]
Voiced	b		d	dh [d]		g			
Fricatives									
Voiceless		f		s	sh [ç]	kh [x]		x [ħ]	h
Voiced								c [ʕ]	
Nasals	m			n					
Trill				r					
Lateral				l					
Approximant					j				
Semivowels	w				y				

Vowels have phonemic distinction in duration (short vs. long) and tongue root position (advanced vs. retracted). While the former is represented in writing, the latter is not. Furthermore, vowel harmony is employed for tounge root position. In each pair of vowels, the advanced form is dominant and the retracted form is recessive. A recessive vowel will under certain circumstances be influenced by the presence of a dominant vowel, and will change into its own dominant form. Examples (after Bell 1953):

Retracted:		Advanced:	
beerta	'the garden	*geela*	'the camels'
sayn	'tail'	*seyntiisii*	'its tail'

In these cases, the words *geela* and *seyntiisii* contain advanced vowels. All vowels in the words thus become advanced.

Accents are not represented in normal written usage, but in this paper I will sometimes use the diacritic marker ´ to indicate accents, especially on accent-based minimal pairs. However, absence of this marker should not be interpreted as if accent is missing. Furthermore, I will follow the spelling of my informants when presenting examples.

Phonological rules.

Some phonological rules, useful for understanding some of the presented examples, are (after Serzisko 1984):

P1: Alveolarization of nasals:

m --> n / _#

niman 'men' *nin* 'man'

P2: Vowel assimilation:

aabe 'father'	aabe + ha	-->	aabaha
	aabe + hii	-->	aabihii
	aabe + hu	-->	aabuhu

P3: Consonant assimilation (orthographic symbols):

(a) k --> g / after g, w, y, i, u, a
(b) k --> Ø / after q, c, kh, x, ', h
(c) k --> h / after e, o
(d) t --> d / after d, q, c, kh, x, ', h, w, y, Vowels
(e) t --> Ø / after l

P4: Consonant and vowel assimilation (contraction):

(a) go + baa --> gaa

Syllable formation.

No syllables may begin or end with more than one consonant, thus excluding CCC, CC#, and #CC sequences on the word level. The following forms show the operation of vowel epenthesis, which breaks up disallowed clusters:

(1) underlying form /dherg/ 'be satisfied', *dhe•reg* (imperative), *dher•gey* 'I was satisfied', *dhe•reg•tey* 'you were satisfied'
(2) underlying form /ilk/ 'tooth', *i•lik* (singular), *il•ko* (plural)

Gender and congruence markers.

Somali nouns have two gender classes (not to be confused with the declension classes discussed below): the masculine and the feminine. Gender is sometimes, but not exhaustively, predictable from the morphological shape of words. Nouns ending in -e are masculine, while nouns ending in -o are feminine.

Furthermore, in the nominal phrase, some constituents agree with the noun. These are the possessive pronouns, the demonstrative pronouns, and the articles. The congruence markers are -k- for masculine nouns, and -t- for feminine nouns. These, in turn, are affected by the phonological rules presented above. Definite articles combine k/t with -ii, -a, or -aa, depending on case and physical presence or absence of the related referent. Examples:

Ninkaani waa kaygii	*Naagtaani waa taydii*
'This man is mine'	'This woman is mine'
Ma wiilkii baa?	*Ma naagtii baa?*
'Is it the boy?'	'Is it the woman'

PREVIOUS TREATMENT OF SOMALI TONOLOGY.

Somali tone-accents have received some attention during this century. The major debate has been whether Somali is a tone language or not. The present prevalent opinion is based on Hyman (1981), who answered the question negatively. Another question is whether to distinguish a special falling tone or not. Boundary marking by tonal means is, to our knowledge, previously untreated for Somali.

Tones of accents.

The first extensive presentation of Somali phonology is Armstrong (1934). Among other things, she shows that there is a correlation between tone patterns and certain grammatical features. These include grammatical gender and number of nouns and different temporal forms of verbs. She distinguishes four types of tones (high, mid, low, and falling), assigns tones to whole syllables, and says that "two-syllabled nouns pronounced with mid-level tones are feminine" and "two-syllabled nouns pronounced with a high followed by a low level tone are mostly masculine" (p. 27). She also points out the connection between stress and tones, saying that stronger stress is given to a syllable with high or falling pitch.

Bell (1953), however, states that "Somali is not a tonal language in the accepted sense of the term, that is words are not normally differentiated only by tone" (p. 9). On the other hand, he states (by an unspecified quote accredited to Andrzejewski) that "differentiation of gender by tone holds good of almost all singular nouns (except those ending in -e, -o and nouns consisting of one short syllable)".

Andrzejewski (1956)[1] analyzes verbs, and classifies their syllables into what he calls Accentual Units, according to their types of relative stress and tones, and their position in a word or sentence. Then he uses these units to construct nine Accentual Patterns (AP) and states that, with a few exceptions, every verbal form has a stable AP.

Hyman (1981) analyzes the prosodic system of a northern dialect of Somali. In his view, the underlying forms of words have no tonal or accentual specifications of their own. Accents are governed by the morphological system, and are sensitive to grammatical categories, phonological shapes, and construction types. Accents are assumed to be properties of morae only, not syllables. Shifting and reduction rules change the placement of accents, and on the surface level they are given pitch values, realizing them as high tones, that follow a downdrift pattern within each accentual phrase. The 'mid' tones occur because tones in feminine words usually have lower pitch values than tones in masculine words. The 'falling' tones are argued to actually be sequences of High-Low (see also the discussion below on long vowels). His distinction is thus binary; accented morae are given high (H) tones, while unaccented morae are given low (L) tones.

Nouns are classified in three declensions, based on (a) accent assignment properties and (b) accent modification properties. For instance, in the first declension, masculine nouns receive an accent on the penultimate mora, while feminine nouns receive an accent on the final mora. The accent is neutralized when the noun is in subject position.

Hyman suggests two complementary accent assignment rules, being valid for all declensions, but also states that there are exceptions. A noun can have one, and only one accent in isolation, on either of the two last vowels. Accent modification rules are then discussed, they are many and complex, and finally the downdrift system is described. In each accentual phrase, the leftmost remaining accent is realized with the highest pitch integer level, and successive accents are realized with lower and lower pitches. Accentual phrases generally have their boundaries (a) after a verbal complex and (b) between two noun phrases in a main clause, but there are occasional variations.

Hyman concludes, that Somali is neither a tone language (since both number and placement of accents are restricted), nor a stress accent

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[1] Andrzejewski certainly has made many other contributions to Somali tones. Unfortunately, I have been unable to obtain them.

language (since accents belong to moras, not syllables, and pitch levels are independent of intonation), but rather a tone-accent one, that realizes underlying accents as a high tone.

Banti (1988) also incorporates the tonal behaviour of nouns into morphological processes and provides an extensive survey of the case system in relation to tones, as well as a comparison with Oromo, a closely related Cushitic language. He suggests a more extensive declension paradigm (five declensions) than Hyman did, based on the inflectional characteristics of different cases, which include accent shifts.

Four cases are distinguished: the absolutive (and unmarked), the genitive, the nominative, and the vocative. The first declension, for instance, consists of nouns with penultimate accent in the absolutive case, final accent in the genitive, no accent in the nominative, and initial accent in the vocative. It should be noted here that both masculine and feminine words occur in most declensions, and that pluralization might change the declension of a word. In addition, some words might optionally be inflected according to two or more paradigms. Banti then deals with the accent assignment rules for all cases and declensions. Accents are assigned to penultimate or final vowels, except in the vocative case, where accent invariably is initial. His conclusion is in line with Hyman's; the accent rules are quite complicated and depend to a great extent on grammar, syntax, and morphology, while the tone rule basically is one and simple; each accent is realized as a H tone.

Saeed (1987), in addition to providing an excellent Somali grammar, points out that "pitch differences are not used so much to distinguish different lexical items ... but to mark grammatical differences" (p. 20).

Biber (1982) discusses Central Somali (based on speakers from the Somali-speaking minority in Kenya) and contrasts it with Northern Somali. The prosodic system is basically the same, tonal accent is prevalent, accents are assigned to morae etc, but on the surface level, accents are shifted one mora to the right.

Tones of long vowels.

Hyman (1981) analyzes long vowels as two morae. Accents may be assigned to either. This explains falling and rising patterns in long vowels; a fall throughout a long vowel is simply analyzed as the first

mora having an accent, while the second is lacking accent. A rise in a long vowel, on the other hand, indicates that the accent is on the second mora, while the first is accentless. In this way, he does away with the otherwise necessary account of 'falling' tones. This allows a grammatical generalization; since 'falling' tones only occur on word-final syllables with two short vowels in sequence, or one long bimoraic vowel (Hyman 1981:173), the relation between accent position and gender is maintained. For instance, the word *tuug* 'thief' is masculine. Assuming an H tone on the first mora of the vowel, rather than a falling tone throughout the whole vowel, leaves the word with penultimate accent, which, as mentioned above, many masculine words have.

Saeed (1987), however, uses the category 'falling tone' (F) alongside with High and Low. He appreciates the descriptive elegancy of Hyman's analysis, but renders it too abstract, and argues that for learners of the language, it is benefactory to identify a separate F tone.

THE RECORDINGS.

In order to be able to study some aspects of Somali tonology on our own, recordings were made of native Somali speakers currently residing in Sweden. Initially, recordings were very informal and tentative, with questions like 'How do you say *xxx* in Somali?'. Later on, more controlled methods were used.

General methodology.

During recordings, the only persons present in the recording environment were the investigator and the informant. Care was taken to avoid background noise. Informants were not paid for participating, but showed great interest in cooperating. Recordings were made at four different occasions, under somewhat different circumstances (for practical reasons). The first and second recordings were made by Adam Issa Ali (hereafter referred to as speaker A), an educated, 50-year old Somali man, speaking Common Somali (the Daarood subgroup, Majeerten clan). There were two months between the successive recordings. The recordings were made in domestic environment with a standard cassette tape recorder.

The third recording was made by Elmi Ali Abdi (hereafter referred to as speaker B), a middle-aged Somali man, also speaking Common Somali, in studio environment. Recordings were made with a DAT-recorder. The fourth recording was made by the same informant and in the same environment as the first and second recordings (yet another month in between), but with material from the third recording.

Both informants have lived in Sweden for several years and use Swedish as their primary language.

In the first three recordings, and parts of the fourth, the methodology was as follows: Since the investigator had no previous knowledge of Somali, sentences and expressions were constructed in Swedish (the mother language of the investigator), with the intention that they should yield Somali translations with interesting tonal phenomena. The sentences were then presented to the informant on paper in written or printed form. The informant translated these into Somali and wrote the translation next to the Swedish expression. During the translation phase, phenomena and construction types of Somali were discussed. Sentences and expressions were presented in groups, and after each group had been translated, this group was recorded before continuing with the next group. The informant thus read his own translations.

With this methodology, problems may occur when Somali and Swedish express things differently. For instance, in Somali, focus is expressed with particles, while in Swedish this is done with accent modifications. Furthermore, Somali adjectives are very often expressed as verbs, and the distinction between predicative and attributive use is not kept apart. However, this problem mostly complicates the construction of relevant data, and the inherent tonal structures of words are not influenced.

In the fourth recording, pre-translated material from the third recording was used, in order to be able to compare the speech of two different speakers. Here, the speaker read another Somalian's translations.

Data Summary.

In total, a database of more than 350 utterances was accumulated, with many different expression types, words in isolation as well as full sentences, two to four examples of each expression, and speech samples from two different speakers.

Analysis methods.

Auditory analysis of the recordings was made by the author. In particular, accent placement and boundary tones (L% or H%) were located.

Acoustic-phonetic analysis (F0 and speech waveform) was also made by the author. The peak-picking algorithm in the SoundScope analysis package on a Macintosh Centris 660AV computer was used to extract F0. Segmentation of F0 contours was made by combined listening and inspection of the speech waveform.

PHONETIC ANALYSIS. Qualitative part.

Nouns, minimal pairs.

In Somali, there are minimal pairs, consisting of one masculine and one feminine form of a concept, that differ only by their accentual properties. Some such pairs are:

Masc.		**Fem.**	
ínan	'son, boy'	*inán*	'daughter, girl'
daméer	'he-donkey'	*dameér*	'she-donkey'
nírig	'baby he-camel'	*niríg*	'baby she-camel'

In these pairs, the masculine member has a H tone on its penultimate mora, while the feminine member has a H tone on its final mora.

Fig. 1 shows F0 patterns of two repetitions of the pair *ínan* and *inán* in isolation, spoken by speaker A. There is a clear difference between the two words; *ínan* (m.) has a falling-rising pattern, with high frequency both at the beginning and at the end of the utterance, while *inán* (f.) is low initially and rises towards the end. This could be interpreted as if *ínan* had two H tones (and thereby two accents). However, when listening to the recordings, the perceptual impression undoubtedly is that the first part of the word *ínan* is more prominent than the second. Furthermore, a phonetically high frequency does in no way imply a phonological H tone, and we shall demonstrate that the rise is a property of the utterance-final position.

Fig. 2 shows the utterances *Ma ínankaa baa* (Fig. 2a) and *Ma inántaa baa* (Fig. 2b). (*Ma* is the interrogative particle, *kaa/taa* are definite articles,*baa* is a focus particle. The sentences mean 'Is it the son?' and 'Is it the daughter?', respectively.) We notice that another constituent (*baa*) takes the utterance-final place. Now we are able to study the true pitch curves of *ínan* and *inán.* The final rise from Fig. 1 has disappeared from *ínan* ; however, it is still present in utterance-final position for *ínankaa baa* (in two out of three cases), but not for *inántaa baa* , where we find instead a L% boundary tone. We therefore discard the possibility that this rise belongs to the word; it rather belongs to the phrase. We conclude that *ínan* (m.) has its H tone on the penultimate mora, while *inán* (f.) has its H tone on the final mora. The boundary tone is assumed to be a list effect, since *ínan - inán* was presented as a pair, in that order.

Another phenomenon should be pointed out while discussing Fig. 2; the first example of *Ma ínanka baa* was mispronounced (or rather; mistoned); the femine pattern was used for the *-ka baa* part. This indicates that the connection between the article and the focus marker (i.e., the modifiers) is stronger than the connection between the stem and the article. The possibility of analyzing suffixes as full words has been used for Somali earlier (Biber 1982) and the error does not affect comprehension; the k/t distinction of the definite article is more important than that the tones are correctly realized (Armstrong 1934). This is also supported by the pair *ínan kee / inán tee* (Fig. 3), where the accents of the nouns are reduced by the interrogative pronoun *kee / tee* (Hyman 1981), but where this, by itself, introduces a distinctive plosive.

Nouns, plural & definite forms.

Many Somali nouns inflect in gender and species as follows:

wiíl	'boy'	*naág*	'woman'
wiílkii	'the boy'	*naágtii*	'the woman'
wiilál	'boys'	*naagó*	'women'
wiiláshii	'the boys'	*naagíhii*	'the women'

Ignoring the allomorphic variation between different declensions, plural markers and definite articles modify a noun by affixing it, each constituent adding a syllable, thus changing the syllable structure. In the

unmarked case, a noun always has its accent on either of the two last morae. What happens with the modified nouns? Does the accent stay in the same position in the stem or, as more syllables enter the word at the end, is it shifted in order to keep the 'two-last-mora' condition?

To investigate the matter, four one-syllable nouns and one two-syllable noun were recorded (recording 4) in: a) citation (unmarked) form, b) with definite article, c) plural form, d) plural and def. article. In order to avoid boundary effects (which, as shown above, may interfere with the tone structure), all configurations were put in a context that queries and focuses a word, i.e., puts it between the interrogative particle *ma* and the focus marker *baa* . Four variants of five nouns were thus recorded. Each expression was read three times. Little variation (except for boundary tones) was found between the different utterances of the same expressions. Figs. 4-8 show the F0-plots of the utterances. For each word group, the order is the one mentioned above.

First, we see that definiteness alone does not affect the accent position in these nouns. The accent stays at the same place, and the article is in no case accented. Second, we see that pluralization of a word does have an effect: the accent is shifted one vowel to the right. In *tuug* and *naag,* the plural forms are *tuugo* and *naago* but they assimilate with *baa.* The case of *tuug* is problematic; the singular forms have their accents within the u both in the indefinite and in the definite, while the plural forms have their accents on different vowels. If the long vowel is analyzed as two morae, one could argue (on basis of the F0) that in the singular, the accents are on the first mora. However, in the indef. plural the accent is shifted one mora to the right, while in the def. plural the accent is shifted two morae to the right. No generalization seems possible; the word inflects irregularly.

In the case of *dibi*, we notice that no special plural morpheme is added; the plural marking is signaled by the tone shift alone. Finally, in *niman* the accent actually is on *baa.* It seems to have been shifted two morae, but the truth is that *niman* is unaccented (Saeed 1987) and that *baa* receives an accent in case the preceding word does not itself have an accent (Hyman 1981).

Pluralization thus affects the accent placement of a word, something which is plausible, considering that the gender of a word often is reversed when the word is put in plural, and that masculine and feminine words have different tonal properties. Indefinite or definite form does not alter

the accent position in these words. However, we shall now proceed to demonstrate that there are nouns for which any modification alters the accent position.

Accent shift in modified nouns.

Two three-syllable, four-morae nouns, *waraábe* ('hyena', masc.) and *magaálo* ('city', fem.) were recorded in isolation, in sentence contexts, and with grammatical suffixes in sentence context. Both speakers did this, two or three examples of each expression. Minor variation was found, both between speakers and between repetitions. Figs. 9 and 10 show F0-plots of *waraábe* and *magaálo* constructions for speaker B.

We see that in isolation, the words have accents within the long vowel. For analytic purposes, these accents are normally assigned to the last mora, but we must keep in mind that this is an abstraction; the domain of the phonetic correlate (a peak) is often the whole vowel. In the noun-modifying contexts, the accents are shifted to the final vowel of the word-stem. It is not the case that they move once per modifier; the accent stays within the noun. This is the case with grammatical suffixes; definite articles, possessive pronouns, focus particle *baa* , and adjectives. In the last case, it should be noted that the grammatical modification is a morphologically isolated process; the modification is completely outside the main word itself. Hyman (1981) also recognized the phenomenon; he categorized nouns ending in -e or -o as declension 2 (D2), and stated an accent shift rule that shifts the penultimate accents of D2 nouns to final positions if the noun is modified (or out of focus). With this analysis, the accent-shift is sensitive to anything being present after the word stem within the noun phrase. Another explanation is to assume that the underlying forms of the words have their accents on the stem-final vowel generally, and that it is the citation form that causes a shift to the left. This would result in a simpler rule.

Utterance internal boundaries.

Internal boundaries in utterances containing more than one noun phrase were studied. There were a total of 28 such sentences in the material, all in recordings 1 and 2 (speaker A). Nine of these were recorded two or

more times. Grammatically, the utterances were (vertical lines indicate where the boundaries are):
(1) coordinated phrases:

Kani waa inankii cadaa | *tanina waa inantii casayd.*
'It is the white son and it is the red daughter.'

(2) comparative phrases:

Jiirkaa | *waraabaha ka fiican.*
'The rat is larger than the python.'

(3) one noun with two coordinated adjectives (gapping):

Inankaa ugu weyn | *uguna fiican.*
'The son is the largest and the best.'

(4) one noun with three coordinated adjectives (gapping):

Inan weyn, | *fiican* | *oo dheer.*
'A big, good and large son.'

The sentences were analyzed auditorily by the author and inspected acoustically (F0) by computer. All sentences shared a similar characteristic: non-final phrases ended in H%, while the final phrase (or word) ended in L%. None of the phrase-final segments carried any accents. The H%s were thus realized on sequences normally given L tones. In the coordinated phrases, the H% appeared before the coordinator. In the comparative phrases, both NP's ended high, while the final modifying adjective ended low.

Internal phrase boundaries are thus marked by a high boundary tone by this speaker. It is of course desirable to confirm this fact quantitatively, with more speakers, more phrases, and other phrase constructions. This pattern occurs in many other languages, of course, but it is interesting to find it even in a tone-accent language. As described earlier, a L tone is the default in Somali; all non-accented segments are likely to be low in tone.

It cannot be ruled out at present that the fact that both informants live in Sweden and use Swedish is a factor to be taken into account. Their phrase boundary marking might be an effect of interference from their knowledge of and use of Swedish, which uses a similar system (cf. Bruce *et al.* 1993).

PHONETIC ANALYSIS. Quantitative part.

Pitch levels of accent tones.

Saeed (1987) stated that the pitch levels of accent tones were lower when directly preceding a pause. This happens to both H and L tones. The downdrift of accents within certain phrases has been discussed above. Clearly, Somali tone distinctions are relative, not absolute. We shall now present some other variabilities of pitch level and attempt to identify their causes.

INVESTIGATION

Data from recordings 3 and 4 are used, since these reflect the speech of two different speakers and contain similar phase constructions. In these recordings, the two speakers read four different nouns, both in isolation and in three different sentence contexts, a total of sixteen utterances per speaker. Speaker B read each utterance twice (recording 3), while Speaker A read each utterance three times (recording 4). In addition, Speaker A read four other nouns, in isolation as well as in sentence contexts, three times each (recording 4).

F0-curves were calculated and plotted by computer and the pitch levels of the accented vowels of the nouns were determined. When the accent was realized as a clear peak (or 'pointed hat') structure (see Fig. 11a), the maximum level of this peak was used, while in cases where the frequency was rising or falling during a segment, an interpolated estimate was made (Fig. 11b). This happened e. g. when the accent was word-initial. This never resulted in a frequency level that lay outside the temporal domain of the vowel. The two methods were used approximately the same number of times for each context. The average results are presented in table 1.

Table 1. Average tone accent frequencies per word and total. Contexts are:

C1 - *Nin* 'Man'
C2 - *Ninkaygaa weyn* 'My big man'
C3 - *Ma ninkii baa?* 'Is it the man?'
C4 - *Waxaan aragnay nin dheer* 'We saw a tall man'

The underlined segments thus change with each word.

	C1	C2	C3	C4
nín	132.6	144.4	157.4	130
naág	126	141	140	121.6
magaálo	118	131	140	126
waraábe	117.6	137	149	128
ínan	130	135	155	124.3
inán	123.3	138.3	140	132.5
daméer	103.3	121	127.5	123.3
dameér	117.5	134	135	125
Total mean (N = 32)	**121.8**	**136**	**144.4**	**126.2**
σ	13.7	10	14.3	9.7

In order to analyze the variances of the means, z -tests (Butler 1985) were performed on the means to determine their variance. The z -scores are shown in table 2.

Table 2. Results of z -tests of variance between the means from table 2.

	C1	C2	C3	C4
C1	-	4.69	6.36	1.46
C2	-	-	2.69	3.95
C3	-	-	-	5.86
C4	-	-	-	-

The critical value for $p \leq 0.01$ in a non-directional test is 2.58. Except for the z -score of (C1,C4) all results are above this value, therefore these means are significantly different, indicating that the actual realization of pitch levels of accents in different contexts varies. (C1,C4) has a

significance level of $p \leq 0.14$, and we shall therefore treat them together. However, we may still distinguish three different pitch levels for the nouns: C3, C2, and C1/C4.

DISCUSSION

Cooper & Sorenson (1981) made a study where they claimed that an F0 downdrift throughout a sentence is a linguistic universal. An accent late in a sentence would be realized with lower pitch than an earlier accent would. This accounts for C3 and C2 being higher than C1/C4, since C3 and C2 are further away from the sentence end than C1/C4.

C3 is closer to the utterance end than C2 (C2 is actually sentence initial), but it has a higher pitch level. There are two possible explanations: C3 is a question (for Swedish, see Gårding 1979), and in C3, the noun is in focus. It is reasonable to assume that a focused noun would have to have a clearer pronunciation, since the speaker wants to emphasize the word. An effect of this is that the accent is made more salient, i.e. realized with higher pitch in order to distinguish it from the rest of the word (for Swedish; see Bruce 1977).

Vowels, apart from having different formant frequencies, also have been shown to have different inherent F0 values (Peterson & Barney 1952). Generally, closed vowels like [i] have been found to have higher inherent F0 values than open vowels like [ɑ]. In Somali, accents are assigned to vowels only. It is therefore possible that the pitches of accented vowels are related to inherent pitch levels. However, if we compare *ínan* and *inán* again, we see that there is variation. In C1 and C3 the i has the highest pitch value, while in C2 and C4, the a is higher. Furthermore, in *daméer* and *dameér* identical vowels are accented, but the latter is invariably higher, sometimes very significantly.

Boundary tones.

As we saw in the discussion on minimal pairs (p. 14) above, boundary tones occur in Somali. The utterance final boundary tone can be either high (H%) or low (L%). On casual examination, H% tended to appear more in utterances with a masculine noun than in utterances with a feminine noun. This might be related to the gender-based position of accents in nouns. A boundary tone has to be different from the preceding

material in order to be noticed altogether. Masculine nouns often end with H-L (accent on penultimate vowel), while feminine nouns mostly end with L-H (accent on final vowel). If the noun is close to the end of the utterance, a principle of contrast would imply that the boundary tone would have to be different from the last part of the noun. This would cause more occurrences of H% after masculine nouns, since the boundary tone then would have to be different from the noun-final L tone.

In order to obtain some insight in the distribution of boundary tones, the occurrences of H% and L% were counted in utterances containing one nominal phrase. This selective restriction was made in order to be able to determine the influence of the gender of the NP. No utterances with an accent-final noun (e.g., *nin*, *inán*) occurring in utterance final position were included, since the H tone of the accent then would obscure the real boundary tone. In total, 264 utterances were studied, including some repetitions of the same expression and representing several sentence types and modes. The examination was done auditorily by the author. Utterances were classified according to their gender and recording occasion. H% was only found in recordings 1,2 and 4, all being recordings by speaker A. Speaker B in recording 3 thus only ended utterances with L%. The results of the other recordings are shown in table 3.

Table 3. Occurrences of H% and L% in utterances with one nominal phrase, grouped according to recording time and gender.

Recording 1 :					Recording 2:				
30 utterances.					46 utterances.				
H%:	20	M: 15	F:	5	H%:	23	M: 18	F:	5
L%:	10	M: 2	F:	8	L%:	23	M: 6	F:	17
		Total: 17		13			Total: 24		22

Recording 4:					Total:				
188 utterances.					264 utterances.				
H%:	52	M: 28	F:	24	H%:	95	M: 61	F:	34
L%:	136	M: 85	F:	51	L%:	169	M: 93	F:	76
		Total: 113		75			Total: 154		110

We immediately notice the large difference between, on the one hand, recordings 1 and 2, and on the other, recording 4. That shall be dealt with in a moment. With the majority of utterances having L%, this tone should be regarded as the default. We will then concentrate on the occurrence of H%. Is there any gender difference? Since there are more masculine phrases than feminine ones, we need to weight the number of occurrences of H%. For all recordings together, the amount of feminine H% then becomes 48 [34 * (154 / 110) = 47.6 ≈ 48]. This would mean that 56% of the H%-occurrences are in masculine NP's, and 44% are in feminine, but the differences between the recordings are so huge that they must be taken into account.

In the first two recordings, there is a clear tendency of masculine NP's having H% more often than feminine NP's. Furthermore, in these two there are higher proportions of H% than in Recording 4. Some of the utterances realized with H% in one of the first two recordings occurred again in the data of Recording 4, but in this recording they were realized with L%. We must also remember that one of the speakers never used a H%. It is therefore reasonable to assume that the variance is a non-grammatic phenomenon; H% and L% differences in one-NP utterances are effects of the speaker's mode, choice of style or the recording situation. However, when a speaker does use a H%, he/she is likely to use it more in masculine NP's.

The utterance final boundary tone of Somali is primarily L%, but a speaker may optionally use H%. This implies that the final position is not intonationally used for grammatical purposes, e.g. tonal marking of questions in Swedish and English.

A question that arises, is how listeners distinguish between an optional H% and an utterance final accentual H tone. Armstrong´s statement on stress mentioned above is a clue. We shall, however, not deal with it here; perceptual topics are outside the scope of this paper.

CONCLUSION.

The intention of this study was to present and investigate some aspects of accentual and tonal features in the Somali language. The results are summarized here.

Accents in Somali are properties of vowels, not syllables. The accents are made prominent by producing a relatively higher pitch on the

vowels where they occur than on the unaccented vowels. Somali has therefore been classified as a tonal accent language (Hyman 1981).

The most important aspects of Somali tone accents of nouns are that they occur on either of the two last vowels of a word and that there is one per noun in isolation. Accents may change position in a word when the word is modified, and they mark grammatical differences, not lexical, i.e., the position of an accent may be the distinguishing factor in a minimal pair (as in *ínan* - *inán*), but this is because the words have different gender, not a lexical difference.

Boundary tones vary with speaker style; there is a possible effect of masculine nouns on the occurrence of H% in single phrases, but only occasionally. When several noun phrases occur in a sentence the utterance internal boundary tones have been found to be H%, while the final boundary is L%.

REFERENCES

Andrzejewski, B.W. (1956) Accentual patterns in verbal forms in the Isaaq dialect of Somali, *Bulletin for the school of Oriental and African Languages* **18**, 103-129

Andrzejewski, B.W. (1971) The role of Broadcasting in the adaptation of the Somali language to modern needs. *In* W.H. Whitley (ed.), *Language use and social change.* Problems of multilingualism with special reference to Eastern Africa. London: Oxford University Press

Armstrong, Lilias E. (1934) *The phonetic structure of Somali.* Reprinted 1964 by Gregg Press, Farnborough

Banti, Giorgio (1988) Two Cushitic Systems: Somali and Oromo Nouns. *In* H. van der Hulst and N. Smith (eds.), *Autosegmental studies on Pitch Accent* . Dordrecht: Foris publications

Bell, C.R.V. (1953) *The Somali Language.* London: Longmans

Biber, Douglas (1982) Accent in the central Somali nominal system, *Studies in African linguistics* **13**, 1-10

Bruce, G. (1977) *Swedish word accents in a sentence perspective* . Lund: Gleerup

Bruce, G., Granström, B., Gustafson, K. and House, D. (1993) Prosodic Modelling of Phrasing in Swedish. *In* Working papers 41 (Lund University Dept. of Linguistics)

Butler, C.S. (1985) *Statistics in Linguistics.* Oxford: Basil Blackwell

Cooper, W. and Sorenson, J.M. (1981) *Fundamental frequency in sentence production* . New York: Springer

Ehret, C. and Ali, M.N. (1984) Soomaali Classification. *In* T. Labahn (ed.), *Proceedings of the Second International Congress of Somali Studies, Vol. 1.* Hamburg: Buske

Gårding, E. (1979) Sentence intonation in Swedish, *Phonetica* **36**, 207-215

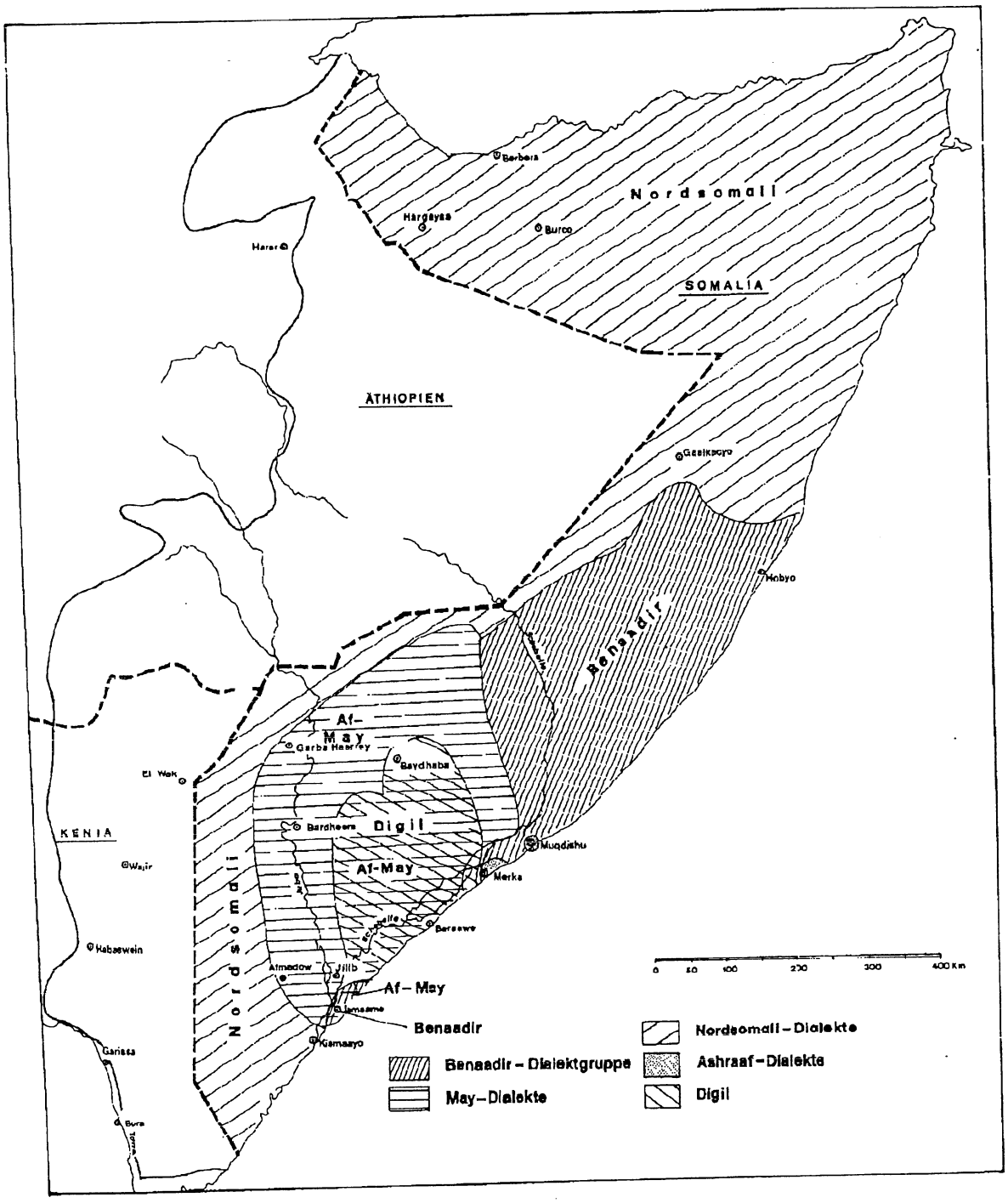
Hyman, L.M. (1981) Tonal accent in Somali, *Studies in African Linguistics* **12**, 169-203

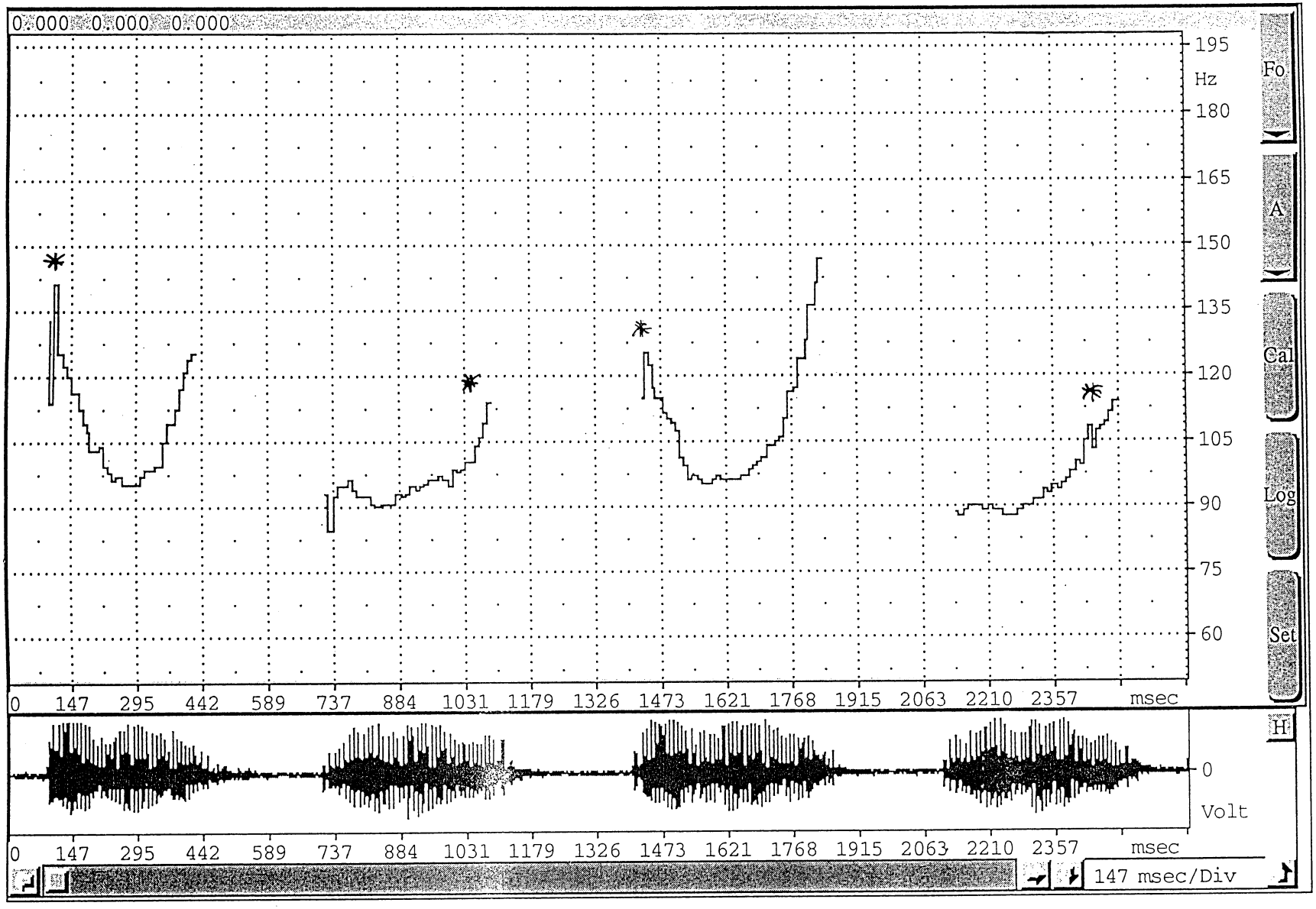
Lamberti, M. (1986) *Die Somali-dialekte: eine vergleichende untersuchung.* Hamburg: Buske

Peterson, G.E. and Barney, H.L. (1952) Control methods used in a study of vowels, *Journal of the Acoustical Society of America* **24**, 174-184

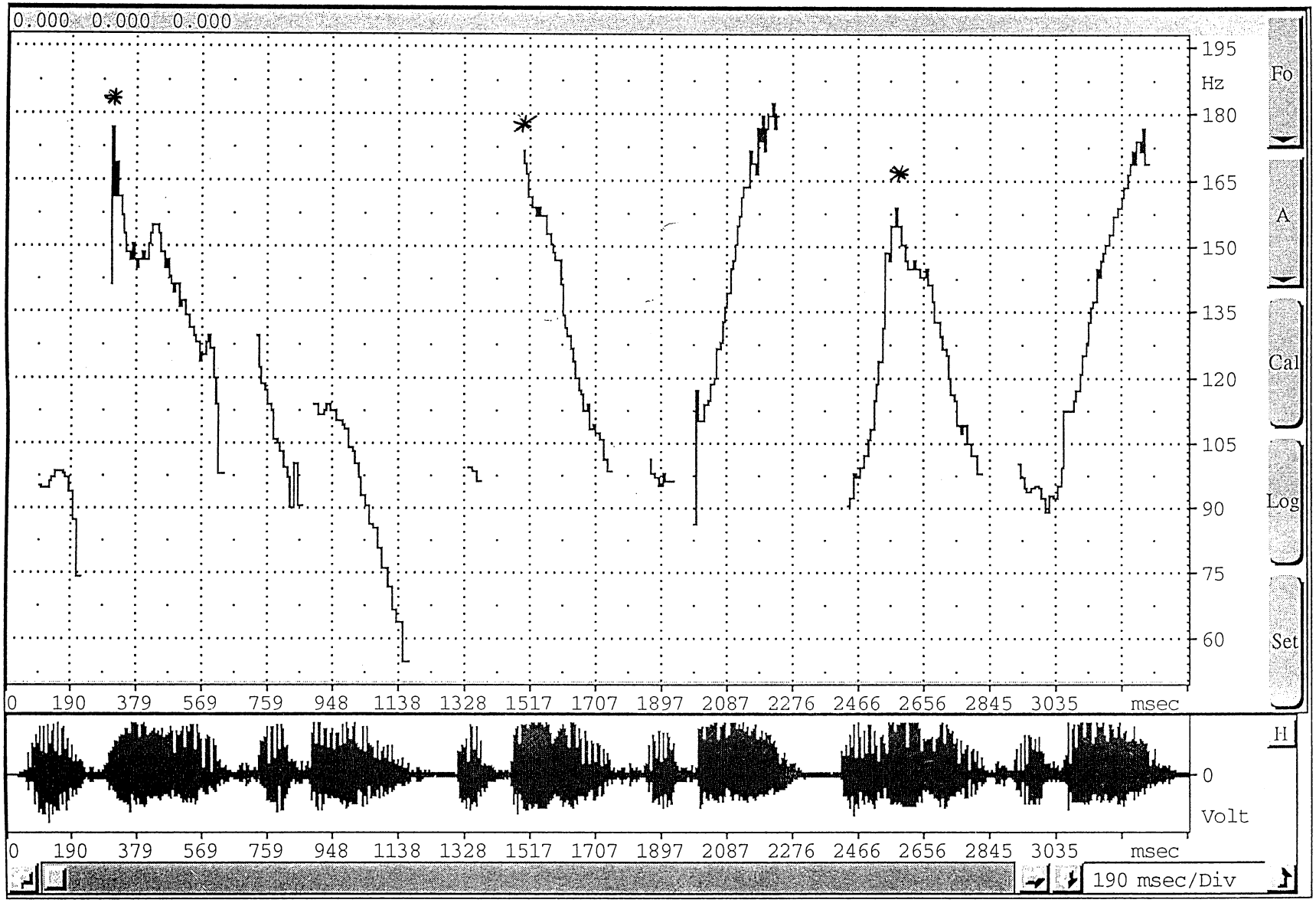
Saeed, J.I. (1987) *Somali Reference Grammar.* Wheaton, Md: Dunwoody
Serzisko, F. (1984) *Der Ausdruch der Possessivität in Somali.* Tübingen: Narr

Karte 4: Ausbreitung der Dialektgruppen

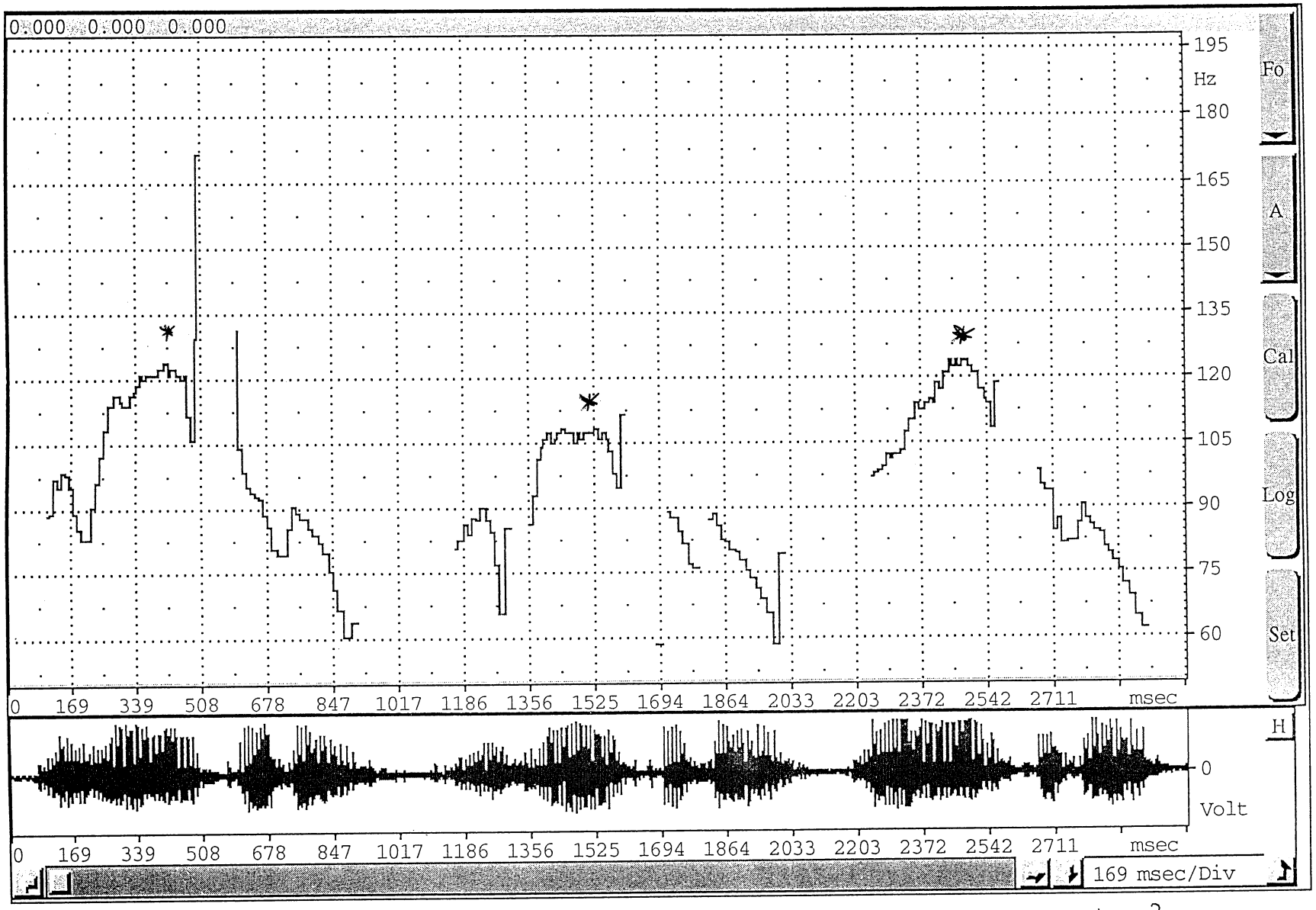




ínan inán ínan inán



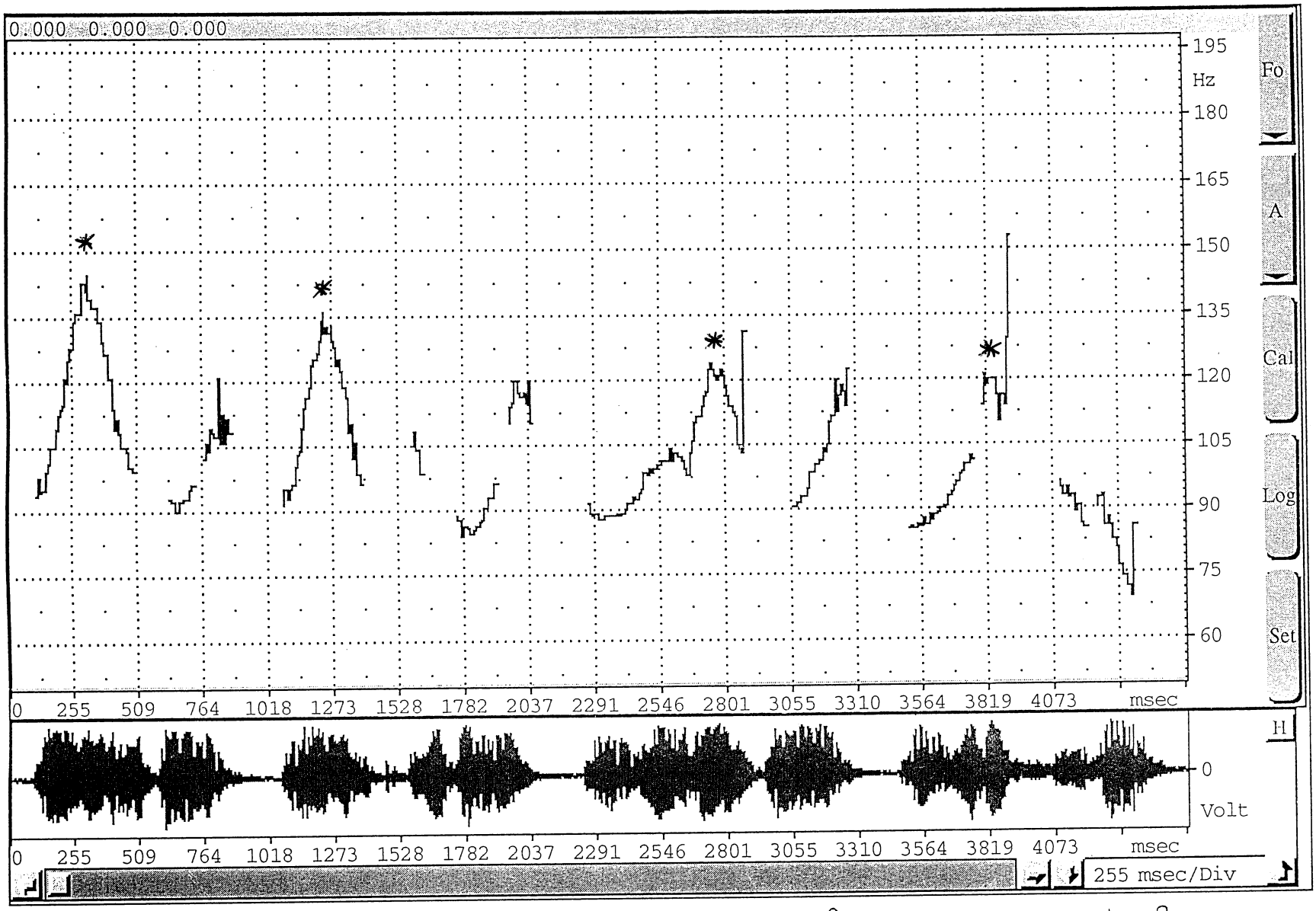
Ma ínan - kaa baa? Ma ínan - kaa baa? Ma ínan - kaa baa?



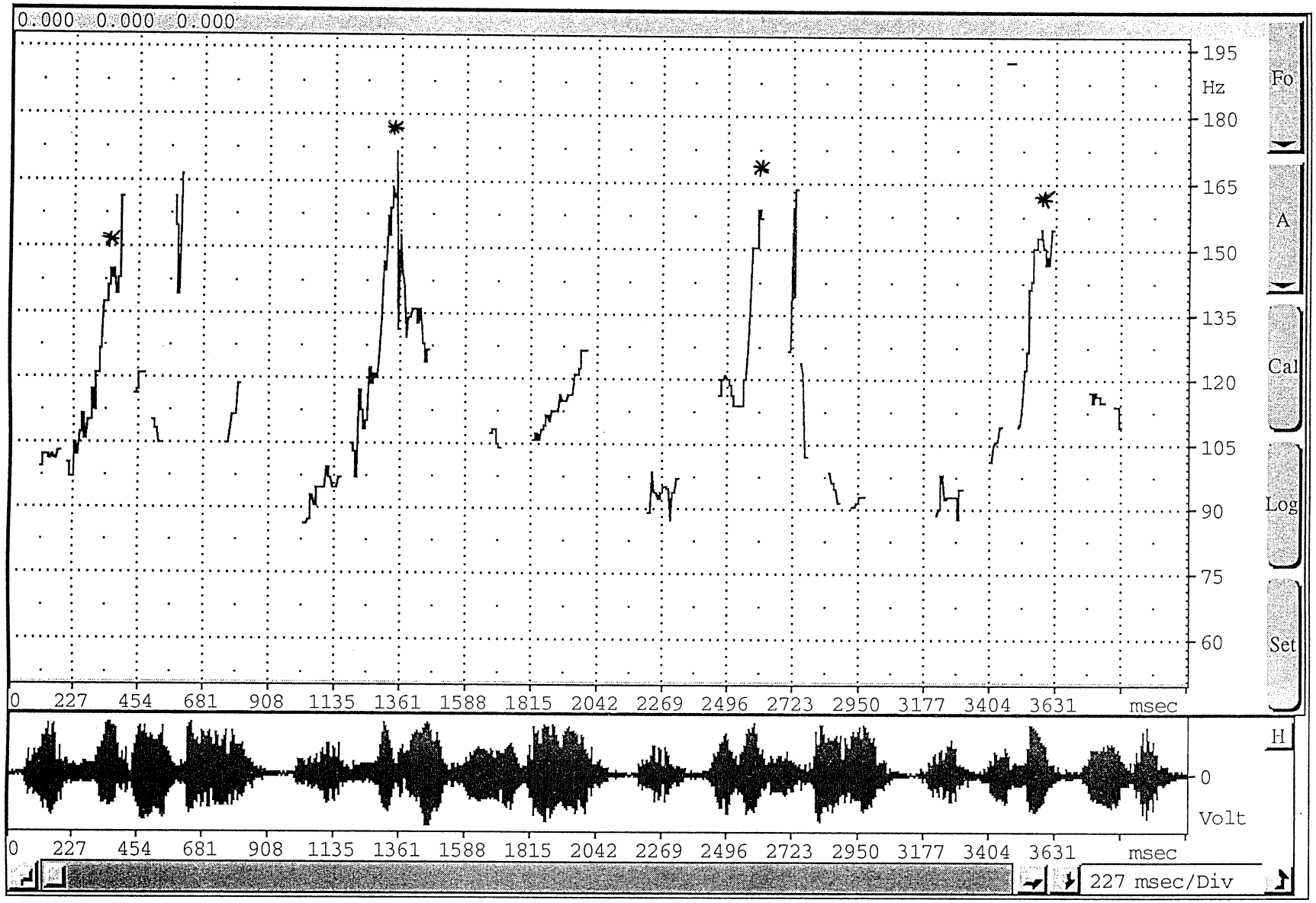
Ma inán - taa baa? Ma inán - taa baa? Ma inán - taa baa?

Fig. 3

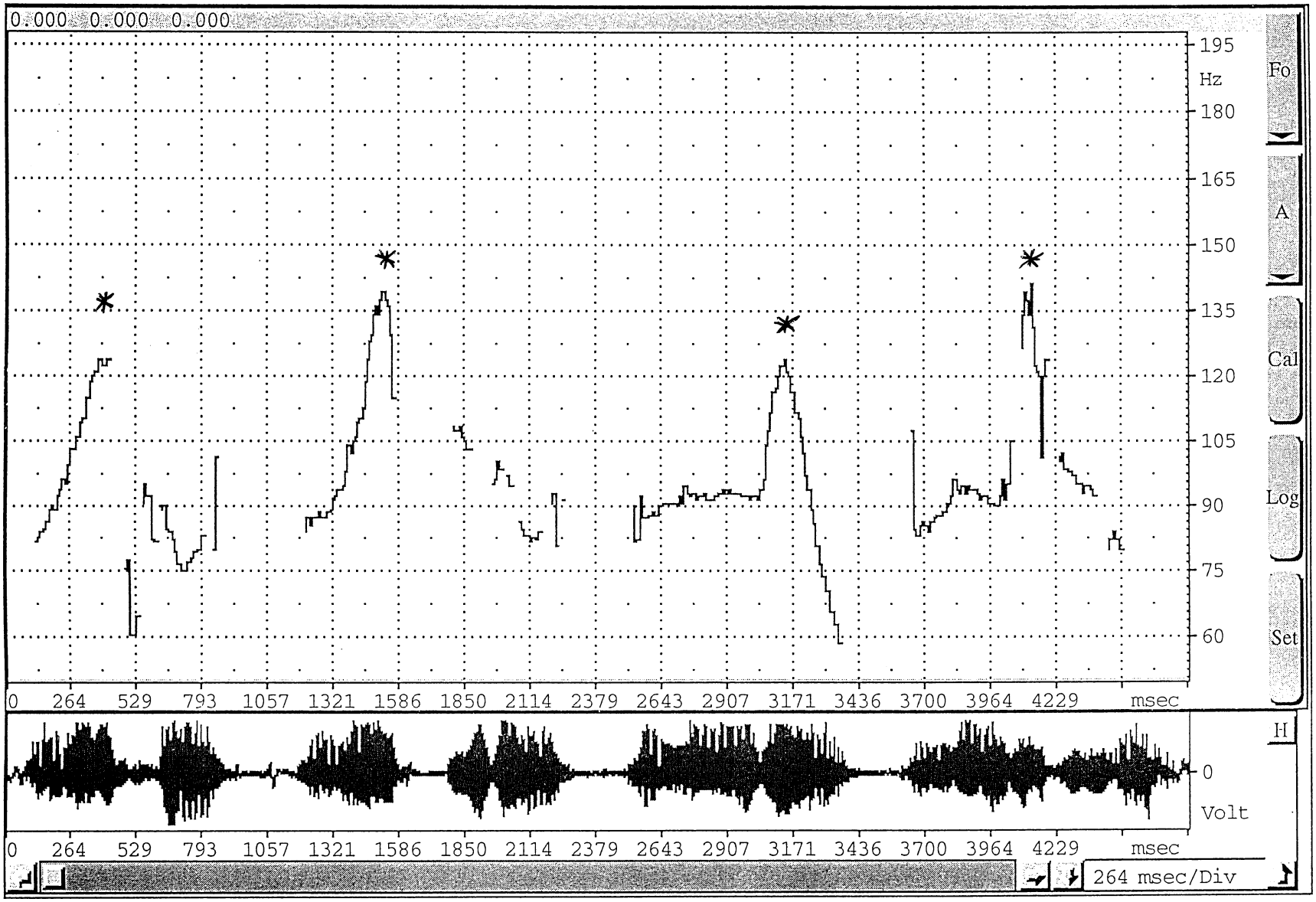
inan kee inan tee inan kee inan tee



Ma wiil ~~kii baa~~ baa? Ma wiil-kii baa? Ma wirl-al baa? Ma wiila shii baa?

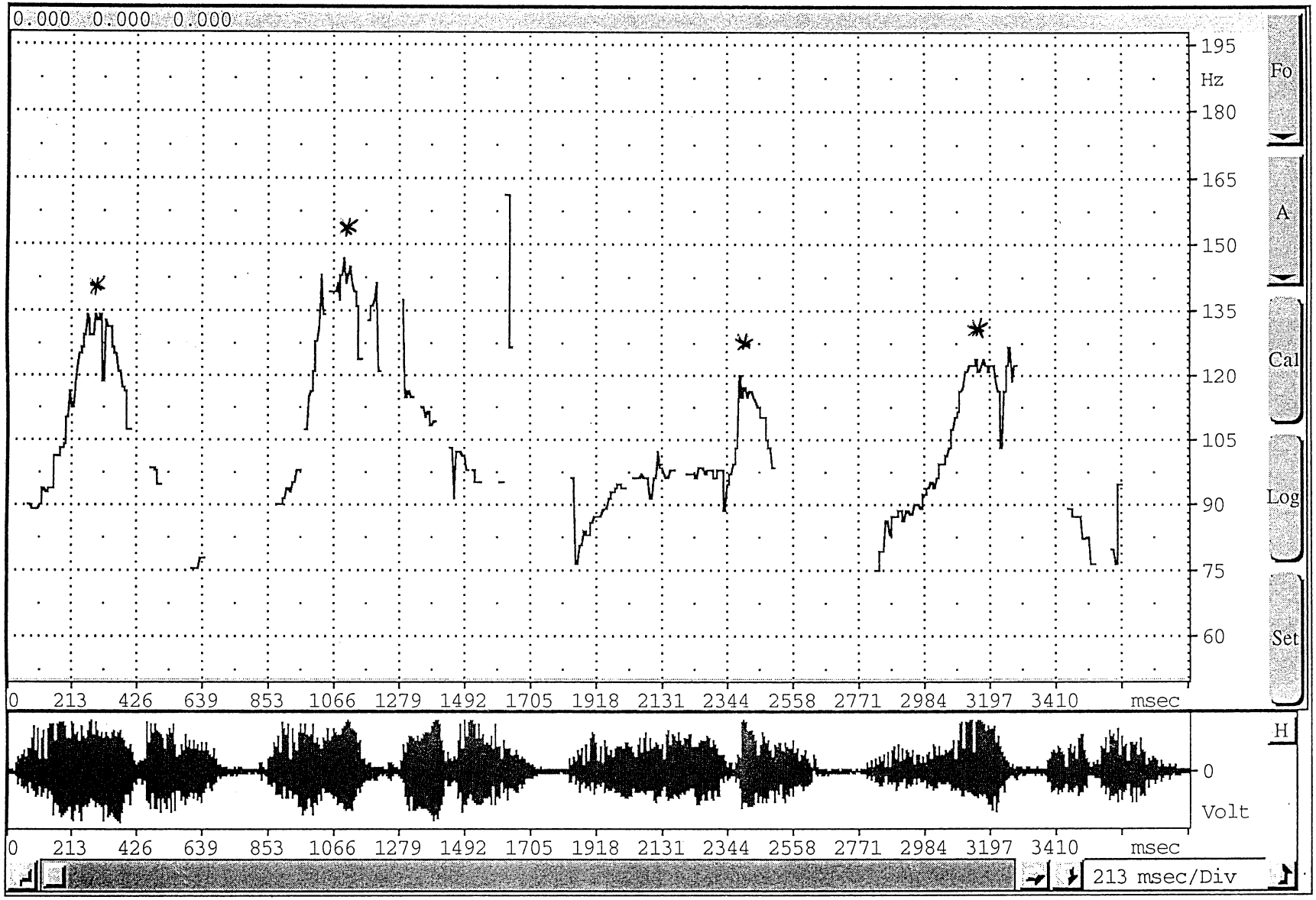


Ma dibi baa? Ma dibi-gii baa? Ma dibi baa? Ma dibi-dii baa?



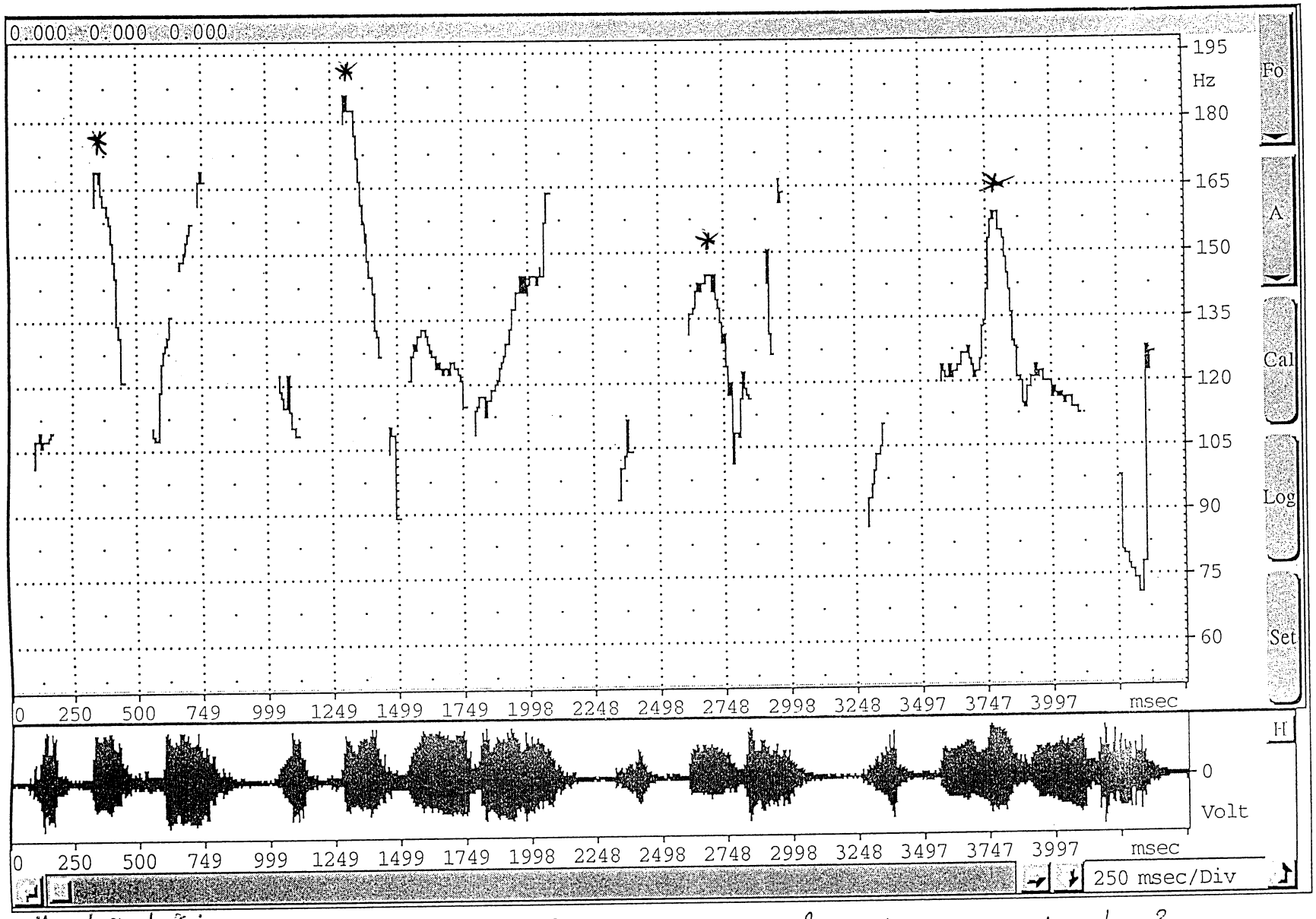
Ma naag baa? Ma naag-tii baa? Ma naaga a? Ma naag i hii baa?

(naago + baa)



Ma nin baa? Ma nin-kii baa? Ma niman baa? Ma niman-kii baa?

Fig. 8



Vowel analysis:

Ma tuug baa? Ma tuugii baa? Ma tuugaa? Ma tuuga-dii baa?

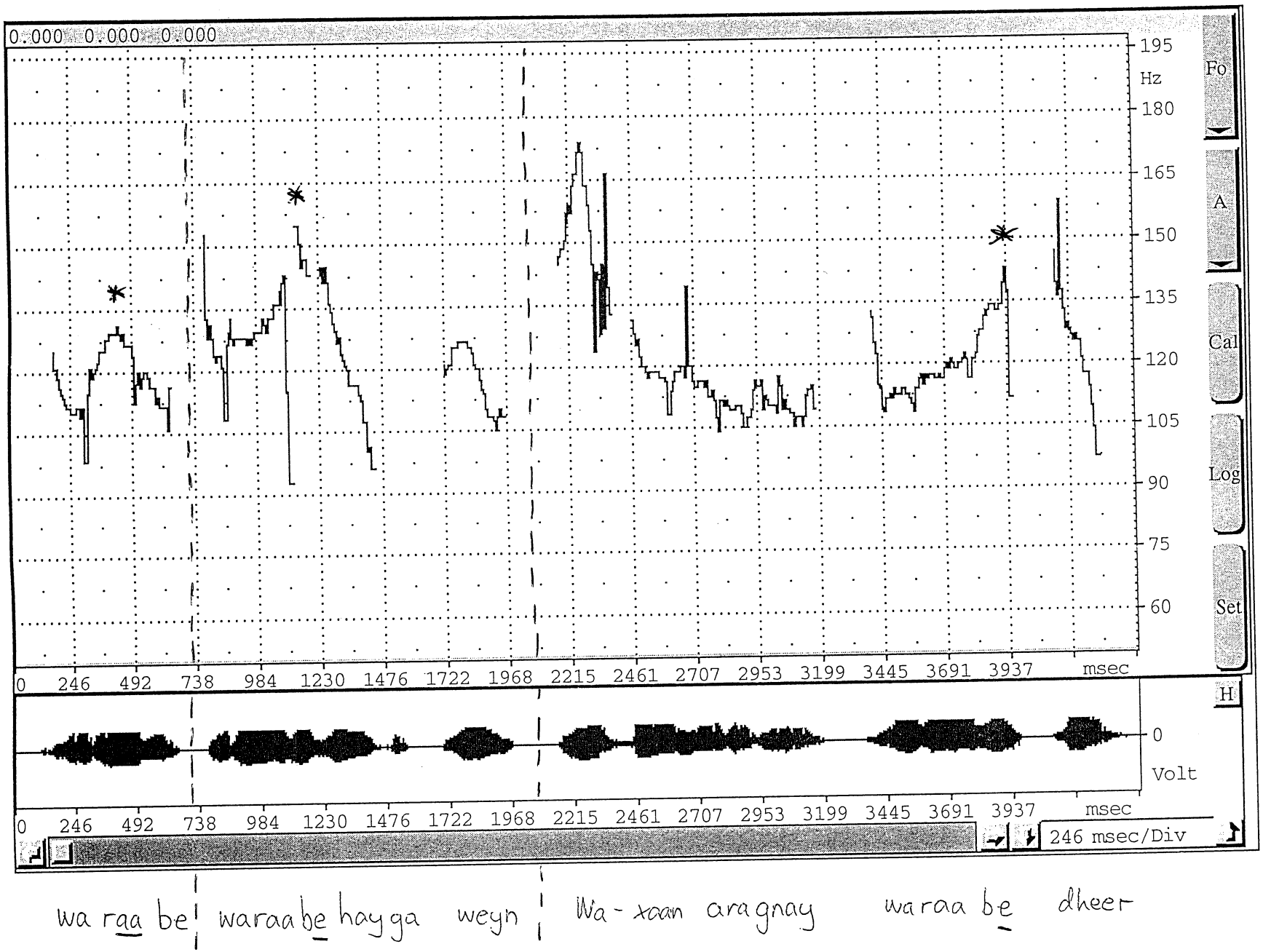
(no shift) (one vowel right)

Mora analysis:

Ma tuug baa? Ma tuugii baa? Ma tuugaa? Ma tuuga-dii baa?

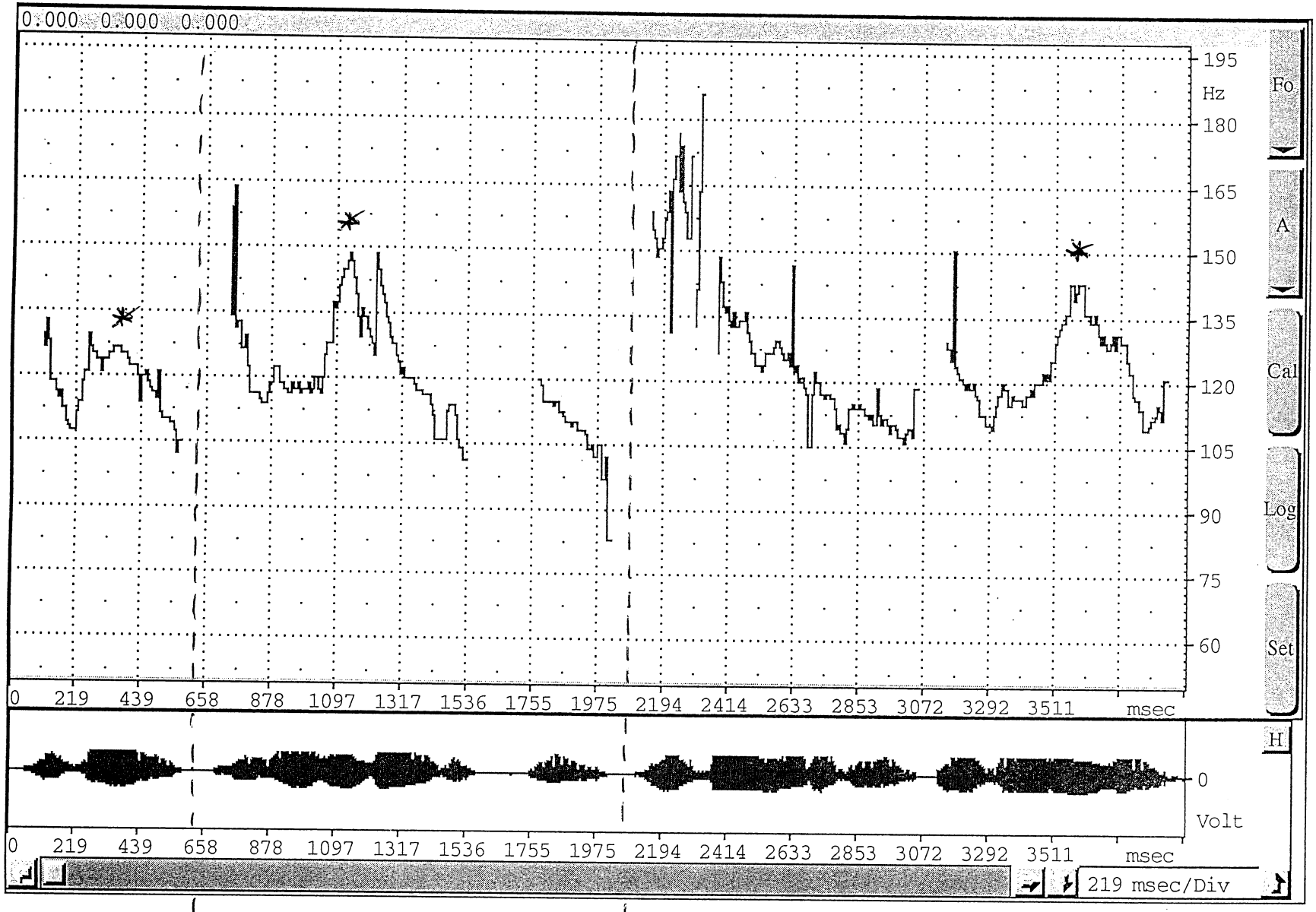
(one mora right) (two morae right)

Fig. 9



wa raa be | waraabe hayga weyn | Wa-xaan aragnay waraa be dheer

Fig. 10



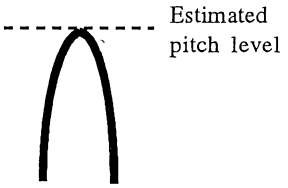
ma gaa lo | ma gaa la day da weyn | Wa-xaan a ra gnay ~~wa ra~~

ma gaa la weyn

Fig. 11. Pitch level estimation methods.

11.a.

POINTED HAT:



11.b.

FALLING OR RISING: