

10.3.5. The WTM Hebrew Morphological Coding Scheme

The Groves-Wheeler Westminster Morphological database (WTM) is stored with each morphological form occupying one record in the database. You do your searches on these forms. Each form consists of a root followed by an "@" (for Hebrew) or a "%" (for Aramaic), followed by a series of morphological codes that describe the form in question. For a description of this coding method see the sections on *An Overview on Doing Greek and Hebrew Searches* (p. 80) and *The Command Line in Detail* (p. 92).

A complete list of all the morphological codes that occur, along with their translations, can be examined by calling up the Morphology Assistant, selecting the Hebrew OT version (WTM), and clicking on the "codes" button. Studying this list is a good way to learn the coding system. The following is a description of the coding system.

The following table details all possible code types for The Hebrew Morphological Database. All fields are required. The '+' sign is required and separates primary codes from secondary codes. It provides an easy way to skip over primary codes for cases in which you are interested only in secondary codes, or to skip over secondary codes. All primary code fields are one character wide and all secondary fields are two characters wide except for the [suffix pgn] which is four. For most searches, secondary codes are not of much interest and can be skipped by terminating the search string with an asterisk ("*") after the primary codes.

To optimize search algorithms and make complex searches feasible with minimal effort we have opted for a fixed field format. That is, each part of speech has all possible tags even though in some cases, especially with verbs, this results in a lot of placeholder tags. This may seem awkward at first, but the less frequently used tags are at the end and a search pattern can be terminated by a wildcard asterisk ("*") at any time to catch all forms.

All the information could have been coded with one character secondary codes, but having two character codes allows you to isolate particular forms without having to type very long code strings. For example, to find all jussive forms you could type "*@*+*Jf*" instead of "*@v????+S???JfC?A?E?R?". The "*+" is necessary to skip to Jussive codes, because 'J' also occurs in the primary codes as a stem type. The two character codes also allow you to find secondary forms scattered across multiple parts of speech. For example "*@*+Aa*" will find all apocopated forms. Since this code occurs in various verb types, with varying field widths, several searches would otherwise be necessary. The codes are case sensitive. Aramaic stem codes are capitalized. Hebrew stem codes are lower case.

Reducing the Amount of Space Used by the Codes

Because of the fixed-field format and the abundance of "optional" codes, the WTM morphology code strings can become quite long and the text displayed in the Results Window can take up a lot of space. Some of the codes are composed mostly of placeholders (the x's) and take up valuable screen real estate. To alleviate this problem BibleWorks allows you to tailor how the secondary codes are displayed. If you RIGHT click on any Hebrew Morphological string in the Results window you will see a context menu with an option labeled "Supplemental Hebrew Codes." This option has a submenu with three selections::

- ☐ No Supplemental Codes
- ☐ Full Supplemental Codes
- ☐ Condensed Supplemental Codes

The last item will display supplemental codes, but only those that are not pure placeholders (x's). In all cases, codes that are not displayed are filled in with a wildcard. This is necessary

to insure that all the lemma/code pairs displayed are actually valid searches.

Note that you can still double click on collapsed codes, but the results will not be the same. Double-clicking on a collapsed code will result in a wider search because of the embedded wild cards. This is intentional and actually works to your advantage. If you want to hide supplemental codes you probably want them all included in searches anyway and this feature does just that.

Possible Code Constructions

The following table lists the required code structures for all possible cases. All parts of speech require all the specified codes, though in many cases the secondary codes will just be placeholders.

Part of Speech	Width	Possible Codes
Noun	11	[n] [type] [gender] [number] [state] + [suffix pgn] [endings] [Homonym] [Reading]
Particle	8	[P] [type] + [suffix pgn] [endings] [Homonym] [Reading]
Pronoun	11	[p] [type] [person] [gender] [number] + [suffix pgn] [endings] [Reading]
Adjective	10	[a] [gender] [number] [state] + [suffixpgn] [endings] [Homonym] [Reading]
Verb - participles	11	[v] [stem] [aspect] [gender] [number] [state] + [suffix pgn] [Homonym] [Reading]
Verb - imperative	13	[v] [stem] [aspect] [gender] [number] + [suffix pgn] [apoc] [endings] [Homonym] [Reading]
Verb - infinitive	11	[v] [stem] [aspect] + [suffixpgn] [apoc] [endings] [Homonym] [Reading]
Verb - other verbs	16	[v] [stem] [aspect] [person] [gender] [number] + [suffix pgn] [jussive] [cohortative] [apoc] [endings] [Homonym] [Reading]

Primary Codes

Noun					
	N	Type	Gender	Number	State
		c common noun p proper name g gentile	m masculine f feminine b both - unspecified (for proper nouns)	s singular p plural d dual - unspecified (for proper nouns)	c construct d determined (Aramaic) a absolute
Particle and miscellaneous					
	P	Type			
		a article s article with inseparable preposition c conjunction d adverb g interrogative	i interjection n negative o direct object marker p preposition r relative		

Pronoun					
	p	Type	Person	Gender	Number
		i independent	1 1st person 2 2nd person 3 3rd person	m masculine f feminine	s singular p plural
		q interrogative	-	-	-
Paragraphing					
	x	Type			
		Paragraph Marker/Num (P@x, S@x, N@x only)			
Adjective/Numeral					
	a	Gender	Number	State	
		m masculine f feminine b both	s singular p plural d dual	c construct d determined (Aramaic) a absolute	

Verb							
Hebrew	√	Stem	Aspect	Person	Gender	Number	State
Aramaic		q qal p piel u pual n niph'al h hiph'il o hoph'al t hithpa'el s hishtaph'el r hothpa'al v hithpo'el w hithpa'lpe'l x nithpa'el a pale'l b pe'alal c pile'l d pilpe'l e pole'l f pol'al g polpal i pul'al y qal pass k po'el l po'al m tiphil	p perfect i imperfect v imperative c infinitive constr a infinitive absolute P participle s qal passive part w waw consec imperf q waw consec perf	1 1st per 2 2nd per 3 3rd per	m masc f fem c com	s sing p plural	c construct a absolute d determined (Aramaic)
		A aph'el B haph'el H hishtaph'el E hithaph'el S hithpa'al F hithpe'el G hithpo'el T hithpa'lpe'l I ish'taph'el J ithpe'el P po'el R shaph'el N pe'al M pael O pe'il D hoph'al Q saph'al K ithpa'al V ithpo'el L itpe'el W tiphel C heph'al					

Secondary Codes

The following table lists the possible "secondary codes" attached to Hebrew morphological code strings.

[jussive] Jussive Forms				
Used to indicate jussive form for verbs, but not used with imperative, participles or infinitives.	J	b jussive in both form and meaning f jussive in form, not meaning m jussive in meaning, but no unique form for jussive x not jussive in form or meaning		
[cohortative] Cohortative Forms				
Used to indicate cohortative form for verbs, but not used with imperative, participles or infinitives.	C	b cohortative in both form and meaning f cohortative in form, not meaning m cohortative in meaning, but no unique form for cohortative x not cohortative in form or meaning		
[apoc] Apocopated Forms				
Used to indicate letters dropped from the end of forms for various reasons. Can appear with all verb forms except participles	A	a apocopated x not apocopated		
[endings] Ending Modifications				
Used to indicate letters added to the end of forms for various reasons. Can appear with all forms.	E	h paragodic ה d directional ד n paragodic נ x no dropped or added letters		
[reading] Qere/Kethib Readings				
Used to indicate whether a form is a Qere or Kethib reading.	R	q form is a Qere Reading k form is a Kethib reading x form is a normal reading		
[Homonym] Lexical entry number for homonyms				
Used to indicate which lexical homonym entry (from Koehler-Baumgartener) is appropriate for the word. Defined for all nouns, verbs, adjectives and particles.	H	x no homonyms for this word a homonym 1 b homonym 2 c homonym 3 etc.		
[suffix] Pronomial/Object Suffixes				
Used to indicate pronominal suffix for nouns and object suffix for verbs, but can appear on other forms as well.	S	Person	Gender	Number
		1 1st person 2 2nd person 3 3rd person x none	m masculine f feminine c common x none	s singular p plural x none

Examples:

@ncmsc+S3msExHbRx	Hebrew, noun, common, masculine, singular, construct, 3rd person masculine singular suffix, no endings, homonym b, not a qere/kethib reading
@vhi2ms+SxxxJbCxAaExHaRx	Hebrew, verb, hiphil stem, imperfect, 2nd person masculine singular, no object suffix, jussive in both form and meaning, not cohortative, apocopated, no endings, not a qere/kethiv reading. In the context the verb has the first lexical meaning cited in Koehler-Baumgartener.