

# Preliminary proposal to encode Book Pahlavi in Unicode

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## 1 Introduction

This is a proposal to encode the ‘Book Pahlavi’ script in Unicode. Other proposals for the script have been submitted previously by different authors:

- 1993: “Unicode Technical Report #3”, Rick McGowan and Joe Becker
- 2007: “Preliminary proposal to encode the Book Pahlavi script in the BMP of the UCS” (L2/07-234), Michael Everson, Roozbeh Pournader, and Desmond Durkin-Meisterernst
- 2013: “Preliminary proposal to encode the Book Pahlavi script in the Unicode Standard” (L2/13-141), Roozbeh Pournader
- 2014: “Proposal for Encoding Book Pahlavi in the Unicode Standard” (L2/14-077), Abe Meyers

The present proposal differs from them by offering:

- an encoding that aligns with Unicode principles and the character-glyph model
- a character repertoire based upon semantically distinctive letters, numbers, and signs that can be used for completely representing the script
- a model that supports the joining structure of the script and variations in the joining behavior of letters
- detailed information on orthography, ligatures, and properties of characters

This document is concerned primarily with presenting an encoding model for Book Pahlavi that provides for the full encoding of printed texts, as these records are currently used by the Zoroastrian and Parsi communities. I am actively conducting research to develop and expand the model. Towards that end, I request feedback from experts and users of the script. A comparison of the advantages of my proposed encoding with previous proposals will be offered in the formal proposal, which is forthcoming. The formal proposal will also include additional background information and a set of specimens of usage. At present, the figures provided in the previous proposals should be consulted.

## 2 Background

The ‘Book Pahlavi’ script is used for writing the Iranian language known as ‘Middle Persian’ (ISO 639-3: pal). Originally spoken in southwestern Iran, this language began to flourish during the 3rd century CE with the rise of the Sasanian dynasty, which succeeded the Parthian dynasty in 224 CE. Middle Persian was used as a prestige language during the Sasanian dynasty, but began to decline after the Arab invasion in 651.

The script is one of three ‘Pahlavi’ writing systems (see table 1). The earliest is known as ‘Inscriptional Pahlavi’. It is derived from the Parthian script, which evolved from a form of Imperial Aramaic. The inscriptional Pahlavi script is a non-cursive *abjad*. The ‘Psalter Pahlavi’ is a full cursive joining *abjad*, derived from the inscriptional form. It is attested in the Syriac Psalter, a Christian manuscript consisting of twelve extant folios, from the c. 5th century CE. The ‘Book Pahlavi’ is the most well-known of these scripts and has the largest extant corpus. It developed from the inscriptional type. Of the three, only Book Pahlavi remains unencoded in Unicode.

The labels ‘inscriptional’ and ‘book’ are scholarly classifications based upon strict assessments of application of the Pahlavi scripts in the available records. Although described as ‘book’ on account of its usage in Zoroastrian literature, the script also occurs in inscriptions, coins, seals, and ostraca. From the perspective of script encoding, the terms ‘inscriptional’, ‘psalter’, and ‘book’ refer to the structure of the scripts, particularly the lapidary nature of the ‘inscriptional’ type and the connected or cursive nature of the ‘psalter’ and ‘book’ forms.

Although common usage of Book Pahlavi declined after the introduction of the Arabic script in the 7th century, it was maintained as an important liturgical and literary script. Alongside the Avestan script, Book Pahlavi continues to possess significance for the Zoroastrian community. The extant literature of Zoroastrianism is written in these scripts. Book Pahlavi was adapted for printing in the late 19th century, and Zoroastrian texts and Middle Persian grammatical studies continue to be printed in India in the script. The script is also actively studied by scholars, especially of Middle Persian language and linguistics, and the history and culture of pre-Islamic Iran.

## 3 Proposed Repertoire

The proposed repertoire for Book Pahlavi contains 29 characters:

- 20 letters
- 2 fixed-form letters
- 2 special ligatures
- 1 word ligature
- 1 particle
- 8 combining signs
- 1 end-of-word mark
- 2 punctuation signs
- 5 numbers

The code chart and names list follows p. 38. The encoded set may differ from traditional and scholarly inventories of the script that occur in manuscript, inscriptional, and printed sources. Such differences naturally

arise from the requirements for digitally representing a script in plain text and for preserving the semantics of characters.

Unicode character names are based upon those of ‘Imperial Aramaic’ characters. This convention has been followed for Unicode encodings for related scripts, eg. Inscriptional Pahlavi and Psalter Pahlavi.

In this document names in italics refer to scholarly names for graphemes while names in small capitals refer to Unicode characters, eg. 𐭪 is *beth* and BOOK PAHLAVI LETTER BETH. For sake of brevity, the descriptor ‘BOOK PAHLAVI LETTER’ is dropped when referring to Book Pahlavi characters, eg. BOOK PAHLAVI LETTER BETH may be referred to as BETH. For letters that have been unified as one character, the graphemes may be referred to using the names of the individual letters, while the character is known using the compound name. For example, 𐭪𐭫 is the character BOOK PAHLAVI LETTER ALEPH-HETH, but may be referred to as either *aleph* or *heth* in discussion of the individual graphemes. Characters of other scripts are designated by their full Unicode names. Latin transliteration of Book Pahlavi follows the current scholarly convention, with Aramaic heterograms given in uppercase letters.

### 3.1 Letters

The following 20 basic letters are proposed. Details on the joining behavior of letters is given in § 5.2.

Character name	Glyph	Joining	Latin
BOOK PAHLAVI LETTER ALEPH-HETH	𐭪𐭫	dual	ʾ, h, x
BOOK PAHLAVI LETTER BETH	𐭪	right	b
BOOK PAHLAVI LETTER GIMEL-DALETH-YODH	𐭫	dual	g, d, y
BOOK PAHLAVI LETTER OLD DALETH	𐭫𐭬	right	d
BOOK PAHLAVI LETTER HE	𐭬	right	h
BOOK PAHLAVI LETTER WAW-NUN-AYIN-RESH	𐭭	right	w, n, ʿ, r
BOOK PAHLAVI LETTER ZAYIN	𐭮	dual	z
BOOK PAHLAVI LETTER KAPH	𐭯	right	k
BOOK PAHLAVI LETTER OLD KAPH	𐭯𐭰	right	k
BOOK PAHLAVI LETTER LAMEDH	𐭰	dual	r
BOOK PAHLAVI LETTER STROKED LAMEDH	𐭰𐭱	dual	l, r
BOOK PAHLAVI LETTER HOOKED LAMEDH	𐭰𐭲	dual	l

BOOK PAHLAVI LETTER OLD LAMEDH	𐭮	right	l
BOOK PAHLAVI LETTER MEM-QOPH	𐭯	dual	m, q
BOOK PAHLAVI LETTER SAMEKH	𐭰	dual	s
BOOK PAHLAVI LETTER ALTERNATE SAMEKH	𐭱	dual	s
BOOK PAHLAVI LETTER PE	𐭲	right	p
BOOK PAHLAVI LETTER SADHE	𐭳	right	c
BOOK PAHLAVI LETTER SHIN	𐭴	dual	š
BOOK PAHLAVI LETTER TAW	𐭵	right	t

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### 3.2 Fixed-form letters

The following two ‘fixed-form’ characters are proposed in order to represent the respective letters when they occur in cases where their normal joining behavior is suspended (see § 6.2 and § 6.4.2). If the different behaviors described in the aforementioned sections may be produced using existing Unicode control characters, then these ‘fixed-forms’ letters may be removed from the proposed repertoire.

Character name	Glyph	Joining	Latin
BOOK PAHLAVI FIXED-FORM ALEPH-HETH	𐭮	dual	ʾ, h, x
BOOK PAHLAVI FIXED-FORM GIMEL-DALETH-YODH	𐭯	dual	g, d, y

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### 3.3 Special Ligatures


The following 2 special ligatures are encoded as atomic characters and their character names are based upon scholarly usage:

Character name	Glyph	Joining	Latin
BOOK PAHLAVI LIGATURE X1	𐭮𐭯	non	x1
BOOK PAHLAVI LIGATURE X2	𐭯𐭰	non	x2

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### 3.4 Word Ligature

The following character is the word for Ahriman, the Zoroastrian antagonist, rotated 180° counter-clockwise. The orientation carries the metaphor of turning away the negative spirit. It occurs primarily in Pahlavi texts of the 9th–12th centuries. It is proposed as an atomic character in order to provide a means for its representation in plain text.

Character name	Glyph	Joining	Latin
BOOK PAHLAVI LIGATURE TURNED AHRIMAN		non	ʾhlmn









### 3.5 Particle

The following character represents the Aramaic heterogram *ZY*. It is proposed as an atomic character in order to provide for its representation in plain text.

Character name	Glyph	Joining	Latin
BOOK PAHLAVI PARTICLE ZY		non	<i>ZY</i>

### 3.6 Combining signs

The following 8 combining signs are used for distinguishing different values for letters that have the same shape:

Character name	Glyph
BOOK PAHLAVI COMBINING DOT ABOVE	
BOOK PAHLAVI COMBINING DOT BELOW	
BOOK PAHLAVI COMBINING TWO DOTS ABOVE	
BOOK PAHLAVI COMBINING TWO DOTS BELOW	
BOOK PAHLAVI COMBINING THREE DOTS ABOVE	
BOOK PAHLAVI COMBINING THREE DOTS BELOW	
BOOK PAHLAVI COMBINING HAT ABOVE	
BOOK PAHLAVI COMBINING HAT BELOW	

### 3.7 End of word mark

The following character is used for marking the end of a word. Also known in some scholarly works as the ‘otiose stroke’, it is used only after letters that do not connect to the left. This character resembles 𐬀 WAW-NUN-AYIN-RESH, but it is encoded as a separate character on account of its character semantics. It is a non-joining character that is used solely for delimiting words.

Character name	Glyph	Joining	Latin
BOOK PAHLAVI END OF WORD MARK	𐬀	non	.

### 3.8 Punctuation

The following two signs of punctuation occur in manuscripts and printed works. They resemble punctuation already encoded in the Avesta block, ie. 𐬀 U+10B3C LARGE TWO DOTS OVER ONE DOT PUNCTUATION and 𐬁 U+10B3E LARGE TWO RINGS OVER ONE RING PUNCTUATION. The difference is that the Book Pahlavi punctuation are not ‘tiny’ or ‘large’ as the Avestan signs, but are of a ‘medium’ or ‘normal’ size. The below characters are, therefore, encoded separately in order to accurately represent the proportions of the signs with surround text.

Character name	Glyph
BOOK PAHLAVI PUNCTUATION THREE DOTS	𐬀
BOOK PAHLAVI PUNCTUATION THREE CIRCLES	𐬁

### 3.9 Numbers

Character name	Glyph	Joining	Latin
BOOK PAHLAVI NUMBER ONE	𐬀	right	1
BOOK PAHLAVI NUMBER TWO	𐬁	right	2
BOOK PAHLAVI NUMBER THREE	𐬂	right	3
BOOK PAHLAVI NUMBER FOUR	𐬃	right	4
BOOK PAHLAVI NUMBER ONE HUNDRED	𐬄	right	100

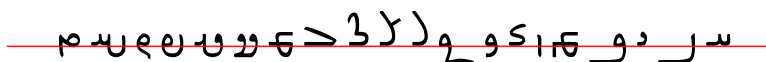
## 4 Script Details

### 4.1 Structure

Book Pahlavi is a cursive joining *abjad*. It is written from right to left, with lines that advance from top to bottom.

### 4.2 Layout considerations

Letters are written on a baseline. The nominal forms of letters are shown below where they occur in relation to the baseline:



The ‘baseline’ is not readily apparent. It may be established by taking the baselines of the nominal shapes of the letters ALEPH-HETH, GIMEL-DALETH-YODH, ZAYIN, LAMEDH, and alternate forms of the latter. The typical ‘head-height’ may be established by the heights of ALEPH-HETH, BETH, GIMEL-DALETH-YODH, etc. Accordingly, all other letters have features that are either ascending or descending.

### 4.3 Punctuation

Spaces are commonly used for separating words. The proposed signs of punctuation are used for indicating text segments of varying length.

### 4.4 Line-breaking

There are no formal rules for the breaking of words at the end of line. Moreover, the available sources do not contain text with words broken across lines. It may be assumed that words were not split at line boundaries. There are no indications of hyphens or other continuation marks. In digital layouts, line-breaks should occur after words.

### 4.5 Collation

The sort order of the letters follows the encoded order:

א ALEPH-HETH < ב BETH < ג GIMEL-DALETH-YODH < ד OLD DALETH < ה HE <  
 ו WAW-ZAYIN-NUN-RESH < ז KAPH < ח OLD KAPH < ט LAMEDH <  
 י STROKED LAMEDH < כ HOOKED LAMEDH < ל OLD LAMEDH < מ MEM-QOPH <  
 נ SAMEKH < ס ALTERNATE SAMEKH < פ PE < ש SHIN < ת TAW

## 5 Joining behavior

### 5.1 Analysis of ligatures

It is commonly said that Book Pahlavi has numerous ‘standard’ or ‘obligatory’ ligatures. Previous proposals for encoding the script did not provide a thorough analysis of these ligatures. However, examples of ligatures are provided in published materials. Such statements and absence of information on ligatures are based upon a lack of understanding of the joining rules for the script.

To be fair, there is no manuscript or scholarly manual that is readily available that specifies such rules. The ambiguity of certain sequences of letters further adds to the supposed complexity of ligatures in the script. Nonetheless, the first step in understanding such ligatures is to analyze the joining behavior of each letter of Book Pahlavi. This process permits a practical method of analyzing all ligatures in the script.

The word *šāhān* ‘kings’ (pl. of *šāh* ‘king’) is written using the following letters:

*nun*   *aleph*   *heth*   *aleph*   *shin*  
 |   𐭠   𐭠   𐭠   𐭡

According to the rules of the script, these five letters are not strung along as

𐭠𐭠𐭠𐭠𐭡

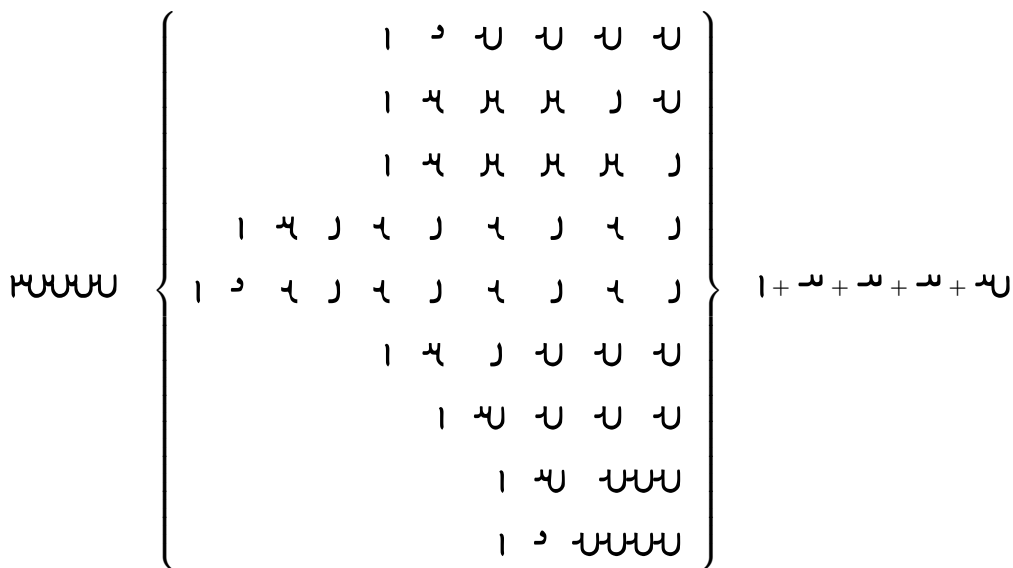
But, are rendered according to the rules of the script as:

𐭠𐭠𐭠𐭠𐭡

In the above, the original shapes of the underlying letters are not easily recognizable, with the exception of the *nun*, and perhaps the penultimate *aleph*. For this reason, encoding 𐭠𐭠𐭠𐭠𐭡 into its constituent characters is difficult. Without knowing the joining behavior of letters, one could conjure up several different ways of analyzing the cursive properties of the letters.

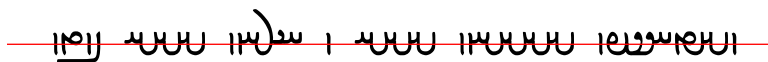
One method is to segment ligatures into primitive graphical components, as was done for producing metal types. Such an approach, however, is quite subjective. It provides for numerous dissections of the ligature into glyphic elements. For example:





There are many other possibilities. Composing Book Pahlavi text using a glyphic model was certainly feasible for metal printing. For that purpose, it was sufficient to graphically reproduce the text of a particular book or manuscript. But, such an approach is not useful for representation of Book Pahlavi texts in a digital medium. It is necessary to represent the underlying characters, more than their graphical appearance. Instead of stringing together a sequence of graphical primitives, it is more valuable from a plain text perspective to use characters that correspond to letters of the script, as this transmits semantic values and identities, and to use font technologies to render the ligatures.

As described in § 4.2, Book Pahlavi letters may be considered to be written on a baseline. The



*wištāsp šāhān šāh ud ērān šāh būd*

<wštʼspʼ šʼhʼnʼ šʼh w ʼylʼnʼ šʼh bwtʼ>

Wištāsp was the king of kings and the king of the Iranians.

The joining rules of certain letters specify that the connection to the next letter occurs not at the baseline, but using a loop that descends basically a full x-height before curving back up to the baseline to join the next letter. In this regard, it is the responsibility of a given letter to ensure that it joins to the following letter according to the rules. This should be applied to typography as well.

Based upon these rules, the cursive connections for producing *šāhān* are as follows:



## 5.2 Joining features

Book Pahlavi letters are traditionally divided into two sets: seven dual-joining and seven right-joining letters. Alternate forms of letters have the same joining properties as the conventional letter. The isolated or nominal forms of letters are typically identical to their initial forms.

The joining features of the dual-joining letters are shown below:

	$X_n$	$X_f$	$X_m$	$X_i$
ALEPH-HETH	𐭠	𐭠-	𐭠-, 𐭠-, 𐭠-	𐭠, 𐭠-, 𐭠-
GIMEL-DALETH-YODH	𐭡	𐭡-	𐭡-, 𐭡-, 𐭡-	𐭡, 𐭡-, 𐭡-
ZAYIN	𐭣	𐭣-	𐭣-	𐭣, 𐭣-
LAMEDH	𐭤	𐭤-, 𐭤-	𐭤-, 𐭤-	𐭤, 𐭤-
STROKED LAMEDH	𐭥	𐭥-, 𐭥-	𐭥-, 𐭥-	𐭥, 𐭥-
HOOKED LAMEDH	𐭦	𐭦-	𐭦-	𐭦
MEM-QOPH	𐭧	𐭧	𐭧	𐭧
SAMEKH	𐭨	𐭨-	𐭨-	𐭨-
ALTERNATE SAMEKH	𐭩	𐭩	𐭩-	𐭩-
SHIN	𐭪	𐭪-	𐭪-	𐭪-

The joining features of the right-joining letters are shown below:

	$X_n$	$X_f$	$X_i$
BETH	𐭪	𐭪̣	𐭪
OLD DALETH	𐭫	𐭫̣	𐭫
HE	𐭬	𐭬̣	𐭬
WAW-NUN-AYIN-RESH	𐭮	𐭮̣	𐭮
KAPH	𐭯	𐭯̣, 𐭯̣̣	𐭯
OLD KAPH	𐭰	𐭰̣	𐭰
OLD LAMEDH	𐭱	𐭱̣	𐭱
PE	𐭲	𐭲̣, 𐭲̣̣, 𐭲̣̣̣	𐭲
SADHE	𐭳	𐭳̣	𐭳
TAW	𐭴	𐭴̣	𐭴

In order to develop a preliminary encoding model for Book Pahlavi, I have analyzed a variety of texts in order to understand and identify the rules for connections between letters, as well as the contextual forms of letters in cursive contexts. I provide these details in the next section.

## 6 Description of Letters

### 6.1 *aleph, heth*


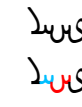
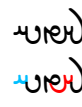
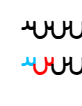
The Book Pahlavi letters *aleph* and *heth* have the same shape and joining behavior. For this reason they are unified into the single character 𐭀 ALEPH-HETH. This character is a dual-joining letter and has the following behavior:

Initial	𐭀	before all letters except those below also before 𐭄 GIMEL-DALETH-YODH in certain cases (see § 6.2)
	𐭁	before 𐭀 ALEPH-HETH, 𐭄 GIMEL-DALETH-YODH, 𐭆 TAW
	𐭂	before 𐭑 PE, 𐭒 SADHE
Medial	𐭀-	before all letters except those below
	𐭁-	before 𐭀 ALEPH-HETH, 𐭄 GIMEL-DALETH-YODH, 𐭆 TAW
	𐭂-	before 𐭑 PE, 𐭒 SADHE
Final	𐭀	after all letters

The regular behavior of ALEPH-HETH is illustrated below. In some words, when ALEPH-HETH precedes GIMEL-DALETH-YODH, its regular joining behavior is suspended, and its nominal form is used instead. This behavior is described in detailed in § 6.2.

<ʔzg>	<i>azg</i>	branch	𐭀 𐭀	𐭀 ALEPH-HETH, 𐭆 ZAYIN, 𐭄 GIMEL-DALETH-YODH
<ʔpykyh>	<i>abēzagīh</i>	purity	𐭀𐭑𐭀𐭑 𐭀𐭑𐭀𐭑	𐭀 ALEPH-HETH, 𐭑 PE, 𐭄 GIMEL-DALETH-YODH, 𐭒 SADHE, 𐭆 KAPH, 𐭄 GIMEL-DALETH-YODH, 𐭀 ALEPH-HETH
<ʔthš>	<i>ātaxš</i>	fire	𐭀𐭆𐭀 𐭀𐭆𐭀	𐭀 ALEPH-HETH, 𐭆 TAW, 𐭀 ALEPH-HETH, 𐭆 SHIN

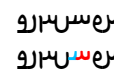
<b'ht>	<i>baxt</i>	destiny	𐭠𐭥𐭥𐭥 𐭠𐭥𐭥𐭥	𐭠 BETH, 𐭥 ALEPH-HETH, 𐭥 ALEPH-HETH, 𐭥 TAW
<GBR'>	<i>mard</i>	man	𐭠𐭥𐭥𐭥 𐭠𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭠 BETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭥 ALEPH-HETH
<š'dyh>	<i>ašāyīh</i>	righteousness	𐭥𐭥𐭥𐭥𐭥𐭥 𐭥𐭥𐭥𐭥𐭥𐭥	𐭥 ALEPH-HETH, 𐭥 SHIN, 𐭥 ALEPH-HETH, 𐭠 GIMEL-DALETH-YODH, 𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH
<g'h>	<i>gāh</i>	special place, throne	𐭥𐭥𐭥 𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH, 𐭥 ALEPH-HETH
<g'h'n>	<i>gāhān</i>	the Gathas	𐭠𐭥𐭥𐭥 𐭠𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH, 𐭥 ALEPH-HETH, 𐭥 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH
<d'h'k'n>	<i>dehgān</i>	landowner	𐭠𐭥𐭥𐭥𐭥 𐭠𐭥𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH, 𐭥 ALEPH-HETH, 𐭥 KAPH, 𐭥 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH
<dhywpt>	<i>dahībed</i>	lord of the land	𐭠𐭥𐭥𐭥𐭥 𐭠𐭥𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH, 𐭠 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭥 PE, 𐭥 TAW
<d't'l>	<i>dādār</i>	creator	𐭠𐭥𐭥𐭥𐭥 𐭠𐭥𐭥𐭥𐭥	𐭠 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH, 𐭥 TAW, 𐭥 ALEPH-HETH, 𐭥 LAMEDH

<hm'hl>	<i>hamahl</i>	someone of equal social standing		𐭌 ALEPH-HETH, 𐭌 ALEPH-HETH, 𐭕 MEM, 𐭌 ALEPH-HETH,   WAW-NUN-AYIN-RESH
<z'hr>	<i>zahr</i>	poison, venom		𐭕 ZAYIN, 𐭌 ALEPH-HETH, 𐭌 ALEPH-HETH,   WAW-NUN-AYIN-RESH
<l'tyh>	<i>rādīh</i>	generosity		𐭕 LAMEDH, 𐭌 ALEPH-HETH, 𐭕 TAW, 𐭕 GIMEL-DALETH-YODH, 𐭌 ALEPH-HETH
<š'h>	<i>šāh</i>	king		𐭕 SHIN, 𐭌 ALEPH-HETH, 𐭌 ALEPH-HETH







## 6.2 ‘fixed-form’ aleph, heth

In some words, when 𐭌 ALEPH-HETH precedes 𐭕 GIMEL-DALETH-YODH, its regular joining behavior is suspended, and its nominal form is used instead. This behavior is morphological in nature and cannot be predicted using conventional rules of the script. Instead of using a control character for modifying the regular behavior of ALEPH-HETH, a ‘fixed’ form of the letter is proposed for encoding: 𐭌 FIXED-FORM ALEPH-HETH. If experts agree that the representations below may be suitably represented using a control character, then the ‘fixed-form’ letter may be withdrawn.

While the ‘fixed’ ALEPH-HETH is used before GIMEL-DALETH-YODH in attested records, it may technically occur before any letter in modern encoded texts. In both of these cases, the following letter is rendered according to its own joining behavior. In the examples below, representations of both regular and ‘fixed’ ALEPH-HETH are given for purposes of comparison:

<i>abāyišnīg</i>	<'p'dšnyk>	pleasing, attractive		𐭌 ALEPH-HETH, 𐭕 PE, <span style="border: 1px dashed black; padding: 0 2px;">𐭌</span> FIXED ALEPH-HETH, 𐭕 GIMEL-DALETH-YODH, 𐭕 SHIN,   WAW-NUN-AYIN-RESH, 𐭕 GIMEL-DALETH-YODH, 9 KAPH
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<i>ēg</i>	<'DYN>	then	𐭠𐭥 𐭠𐭥𐭥	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH
<i>ēk</i>	<'dwk>	one	𐭠𐭥𐭥 𐭠𐭥𐭥	𐭠 ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭥 KAPH
<i>ay</i>	<'y>	O! (exclam. part.)	𐭠 𐭠	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH
<i>ēkānag</i>	<'ywk'nk>	single, identical	𐭠𐭥𐭥𐭥 𐭠𐭥𐭥𐭥	𐭠 ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭥 KAPH, 𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭥 KAPH
<i>kū</i>	<'YK>	where? that, so that	𐭠𐭥 𐭠𐭥	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 OLD KAPH
<i>kas</i>	<'YŠ>	person, body	𐭠𐭥𐭥 𐭠𐭥𐭥	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 SHIN
<i>ēdōn</i>	<'ytwn>	thus, in this way	𐭠𐭥𐭥𐭥 𐭠𐭥𐭥𐭥	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 TAW, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 WAW-NUN-AYIN-RESH
<i>ēč</i>	<'yc>	something	𐭠𐭥 𐭠𐭥	𐭠 FIXED ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 SADHE
<i>ašāyīh</i>	<'š'dyh>	righteousness	𐭠𐭥𐭥𐭥𐭥 𐭠𐭥𐭥𐭥𐭥	𐭠 ALEPH-HETH, 𐭥 SHIN, 𐭠 ALEPH-HETH, 𐭥 GIMEL-DALETH-YODH, 𐭥 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH

<i>Ērānwēz</i>	<'yl'nwyc>	mythical homeland of the Iranians		𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH, 𐭲 LAMEDH, 𐭮 ALEPH-HETH, 𐭥 WAW-NUN-AYIN-RESH, 𐭮 WAW-NUN-AYIN-RESH, 𐭲 GIMEL-DALETH-YODH, 𐭥 SADHE
<i>gyān</i>	<HY'>	soul		𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH, 𐭮 ALEPH-HETH
<i>huparistā</i>	<hwplst'y>	of good service		𐭮 ALEPH-HETH, 𐭥 WAW-NUN-AYIN-RESH, 𐭮 PE, 𐭲 LAMEDH, 𐭮 SAMEKH, 𐭮 TAW, 𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH
<i>way</i>	<w'd>	bird		𐭥 WAW-NUN-AYIN-RESH, 𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH
<i>rāy</i>	<l'd>	possessive postposition		𐭲 LAMEDH, 𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH
<i>nāyīzag</i>	<n'yck>	reed, straw, tube		𐭥 WAW-NUN-AYIN-RESH, 𐭥 FIXED ALEPH-HETH, 𐭮 GIMEL-DALETH-YODH, 𐭥 SADHE, 𐭮 KAPH

### 6.3 Beth

The letter *beth* is represented using 𐭪 BETH. It is a right-joining letter. Its joining behavior is:

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Final 𐭪 after all dual-joining letters


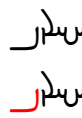

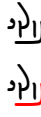

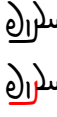
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Letters that follow *beth* are written after the right descender of 𐭪 and above the horizontal stroke, nested within the letter. The behavior of BETH is illustrated below.



<'B>	<i>pid</i>	father		א ALEPH-HETH, ב BETH
<'hlwb>	<i>ahlaw</i>	righteous		א ALEPH-HETH, א ALEPH-HETH, ד LAMEDH,   WAW-NUN-AYIN-RESH, ב BETH
<bg>	<i>bay</i>	god, majesty		ב BETH, ג GIMEL-DALETH-YODH
<bwlnd>	<i>buland</i>	tall, high		ב BETH,   WAW-NUN-AYIN-RESH, ד LAMEDH,   WAW-NUN-AYIN-RESH, ג GIMEL-DALETH-YODH
<bwc>	<i>buz</i>	goat		ב BETH,   WAW-NUN-AYIN-RESH, ע SADHE
<hlbwl>	<i>Harburz</i>	the mountain surrounding the world		א ALEPH-HETH, ד LAMEDH, ב BETH,   WAW-NUN-AYIN-RESH, ד LAMEDH, ע SADHE

When *beth* occurs more than once in character sequence, the horizontal stroke of each preceding *beth* is lowered to accommodate each subsequent occurrence. This behavior results in a nested appearance in which the horizontal stroke of the left-most *beth* is nested within the lowered stroke of each preceding *beth*.

<BB'>	<i>dar</i>	door, chapter		ב BETH, ב BETH, א ALEPH-HETH
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#### 6.4 *gimel, daleth, yodh*

The Book Pahlavi letters *gimel*, *daleth*, *yodh* have the same shape and joining behavior, and are therefore unified as the single character ג GIMEL-DALETH-YODH. It is a dual-joining letter, whose regular behavior is illustrated below.

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Initial	<p>𐭠 before all letters except those below also before 𐭡 GIMEL-DALETH-YODH in certain cases (see below)</p> <p>𐭡 before 𐭣 PE, 𐭤 SAMEKH also before 𐭡 GIMEL-DALETH-YODH in certain cases (see below)</p> <p>𐭢 before 𐭠 ALEPH-HETH, 𐭡 GIMEL-DALETH-YODH, 𐭣 TAW</p> <p>𐭠 before 𐭥 KAPH</p>
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Medial	<p>𐭠 before all letters except those below also before 𐭡 GIMEL-DALETH-YODH in certain cases (see § 6.4.2)</p> <p>𐭡 before 𐭣 PE, 𐭤 SAMEKH</p> <p>𐭢 before 𐭠 ALEPH-HETH, 𐭡 GIMEL-DALETH-YODH, 𐭣 TAW</p> <p>𐭠 before 𐭥 KAPH</p>
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Final	<p>𐭠 after all letters</p>
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<b'pyl'yk>	<i>bābēlāyīg</i>	Babylonian	<p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p> <p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p>	<p>𐭠 BETH, 𐭠 ALEPH-HETH, 𐭣 PE, 𐭡 GIMEL-DALETH-YODH, 𐭤 LAMEDH, 𐭠 ALEPH-HETH, 𐭡 GIMEL-DALETH-YODH, 𐭣 KAPH</p>
<g'ywmlt>	<i>Gayōmard</i>	Gayōmard	<p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p> <p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p>	<p>𐭡 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH, 𐭡 GIMEL-DALETH-YODH, 𐭦 MEM-QOPH, 𐭤 LAMEDH, 𐭣 TAW</p>
<gwlg>	<i>gurg</i>	wolf	<p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p> <p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p>	<p>𐭡 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭤 LAMEDH, 𐭡 GIMEL-DALETH-YODH</p>
<d'm>	<i>dām</i>	creation	<p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p> <p>𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿</p>	<p>𐭡 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH, 𐭦 MEM-QOPH</p>

<DKYA>	<i>pāk</i>	pure, clean	𐭩𐭥𐭫 𐭩𐭥𐭫	𐭩 GIMEL-DALETH-YODH, 𐭥 KAPH, 𐭩 GIMEL-DALETH-YODH, 𐭫 ALEPH-HETH
<dlygws>	<i>driyōš</i>	poor	𐭩𐭥𐭫𐭮 𐭩𐭥𐭫𐭮	𐭩 GIMEL-DALETH-YODH, 𐭮 LAMEDH, 𐭩 GIMEL-DALETH-YODH, 𐭩 GIMEL-DALETH-YODH, 𐭫 WAW-NUN-AYIN-RESH, 𐭮 SHIN
<drwyst>	<i>drust</i>	healthy, sound	𐭩𐭥𐭫𐭮𐭫 𐭩𐭥𐭫𐭮𐭫	𐭩 GIMEL-DALETH-YODH, 𐭫 WAW, 𐭫 WAW, 𐭩 GIMEL-DALETH-YODH, 𐭮 SAMEKH, 𐭫 TAW
<ym>	<i>yam</i>	Jam	𐭩𐭥 𐭩𐭥	𐭩 GIMEL-DALETH-YODH, 𐭥 MEM-QOPH
<myš>	<i>mēš</i>	sheep	𐭩𐭥𐭫 𐭩𐭥𐭫	𐭥 MEM-QOPH, 𐭩 GIMEL-DALETH-YODH, 𐭮 SHIN
<šyl>	<i>šēr</i>	lion	𐭮𐭫 𐭮𐭫	𐭮 SHIN, 𐭩 GIMEL-DALETH-YODH, 𐭮 LAMEDH

### 6.4.1 Rendering adjacent sequences

When GIMEL-DALETH-YODH is followed immediately by another instance of the same letter, then its contextual form is determined by that of the second GIMEL-DALETH-YODH. The cases described below are to be considered regular rendering behaviors for adjacent sequences of this letter.

1. When the second 𐭩 is rendered as 𐭫 — as before 𐭫 ALEPH-HETH or 𐭫 TAW or another immediately adjacent GIMEL-DALETH-YODH — then the first 𐭩 is rendered as 𐭫. Compare *gēhān* and *gētīy* to *gyāg*:

<gyh'n>	<i>gēhān</i>	living beings	𐭩𐭥𐭫 𐭩𐭥𐭫	𐭩 GIMEL-DALETH-YODH, 𐭩 GIMEL-DALETH-YODH, 𐭫 ALEPH-HETH, 𐭫 WAW-NUN-AYIN-RESH
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<gyw'g>	<i>gyāg</i>	place	𐭪𐭥𐭬	𐭪 GIMEL-DALETH-YODH,
			𐭪𐭥𐭬𐭮	𐭪 GIMEL-DALETH-YODH,
			𐭮	𐭮 WAW,
			𐭪	𐭪 ALEPH-HETH,
			𐭪	𐭪 KAPH
<gyty>	<i>gētīy</i>	this world	𐭪𐭥𐭬	𐭪 GIMEL-DALETH-YODH,
			𐭪𐭥𐭬	𐭪 GIMEL-DALETH-YODH,
			𐭮	𐭮 TAW,
			𐭪	𐭪 GIMEL-DALETH-YODH

2. When the second 𐭪 is shaped as 𐭮 — as before 𐭪 KAPH — then the first 𐭪 is rendered using its nominal form:

<nzdyk>	<i>nazdīk</i>	near	𐭮𐭪𐭮	𐭮 WAW-NUN-AYIN-RESH,
			𐭮𐭪𐭮	𐭮 ZAYIN,
			𐭪	𐭪 GIMEL-DALETH-YODH,
			𐭪	𐭪 GIMEL-DALETH-YODH,
			𐭪	𐭪 KAPH

#### 6.4.2 'Fixed-form' *gimel, daleth, yodh*

In some words, in an adjacent sequence of GIMEL-DALETH-YODH the first is rendered using its nominal form, while the second is shaped based upon the following letter. This behavior differs from the representation of the words *gēhān* and *gētīy*, as described above. The exceptional cases require some mechanism for representing a form of GIMEL-DALETH-YODH that does not change its shape. This behavior is morphological in nature and cannot be predicted using conventional rules of the script. Instead of using a control character for modifying the regular behavior of GIMEL-DALETH-YODH, a 'fixed' form of the letter is proposed for encoding: 𐭪 FIXED-FORM GIMEL-DALETH-YODH. If experts agree that the representations below may be suitably represented using a control character, then the 'fixed-form' letter may be withdrawn. The FIXED-FORM GIMEL-DALETH-YODH is to be used for representing the following cases:

1. Exception in the rendering of the sequence <GIMEL-DALETH-YODH, GIMEL-DALETH-YODH, ALEPH-HETH>. Compare the rendering of the *gēhān*, from above, with *spazgīh*:

<gyh'n>	<i>gēhān</i>	living beings	𐭪𐭥𐭬	𐭪 GIMEL-DALETH-YODH,
			𐭪𐭥𐭬	𐭪 GIMEL-DALETH-YODH,
			𐭪	𐭪 ALEPH-HETH,
			𐭮	𐭮 WAW-NUN-AYIN-RESH

<spzgyh>	<i>spazgīh</i>	slander	𐭥𐭥𐭥𐭥 𐭥𐭥𐭥𐭥	𐭥 SAMEKH, 𐭥 PE, 𐭥 ZAYIN, 𐭥 FIXED-FORM GIMEL-DALETH-YODH, 𐭥 GIMEL-DALETH-YODH, 𐭥 ALEPH-HETH
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2. Exception in the rendering of the sequence <GIMEL-DALETH-YODH, GIMEL-DALETH-YODH>:

<'whrmzd>	<i>Ohrmazd</i>	Ahura Mazda	𐭥𐭥𐭥𐭥 𐭥𐭥𐭥𐭥	𐭥 ALEPH-HETH, 𐭥 WAW-NUN-AYIN-RESH, 𐭥 ALEPH-HETH, 𐭥 WAW-NUN-AYIN-RESH, 𐭥 MEM, 𐭥 FIXED-FORM GIMEL-DALETH-YODH 𐭥 GIMEL-DALETH-YODH
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The sequence 𐭥 FIXED-FORM GIMEL-DALETH-YODH + GIMEL-DALETH-YODH has commonly been written and interpreted as 𐭥, a sequence of ALEPH-HETH. The proposed model aims to provide a means for encoding the underlying sequence of characters. Rendering the underlying text using a shaping variant should be handled by substitutions in a font.

6.5 ‘old’ *daleth*

An archaic form 𐭥 of *daleth* occurs in historical spellings. This form is inherited from Psalter Pahlavi. It has a distinctive shape and differs in its joining behavior from *daleth*. This letter is encoded separately as OLD DALETH.

<i>zrēy</i>	<zlyd>	sea, ocean	𐭥𐭥 𐭥𐭥	𐭥 ZAYIN, 𐭥 LAMEDH, 𐭥 GIMEL-DALETH-YODH, 𐭥 OLD DALETH
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6.6 **he**

The letter 𐭥 HE is used only in Aramaic heterograms. It often resembles the sequence 𐭥 or 𐭥 *mem* + 𐭥 *nun* (or *waw*). But, it is encoded as a separate character because of its semantic value and its treatment as an atomic unit.

<i>xwēš</i>	<NPŠE>	own	𐭠𐭥𐭮𐭲 𐭠𐭥𐭮𐭲	𐭠 WAW-NUN-AYIN-RESH, 𐭥 PE, 𐭮 SHIN, 𐭲 HE
<i>ham</i>	<HWEm>	I am	𐭠𐭠𐭮 𐭠𐭠𐭮	𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 HE, 𐭠 MEM
<i>abāg</i>	<LWTE>	together with	𐭠𐭠𐭮 𐭠𐭠𐭮	𐭠 LAMEDH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 TAW, 𐭠 HE
<i>sahist</i>	<MDMHN-st>	seemed	𐭠𐭠𐭮𐭠𐭮 𐭠𐭠𐭮𐭠𐭮	𐭠 MEM, 𐭠 GIMEL-DALETH-YODH, 𐭠 MEM, 𐭠 HE, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 SAMEKH, 𐭠 TAW
<i>čē</i>	<MH>	what, which?	𐭠𐭠 𐭠𐭠	𐭠 MEM, 𐭠 HE

### 6.7 waw, nun, ayin, resh

These four letters have the same shape and joining behavior, and are unified as the single character 𐭠 WAW-NUN-AYIN-RESH.

<i>urwar</i>	<'wlwl>	plant	𐭠𐭠𐭮 𐭠𐭠𐭮	𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 LAMEDH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 LAMEDH
<i>ādur</i>	<'twr>	fire	𐭠𐭠𐭮 𐭠𐭠𐭮	𐭠 ALEPH-HETH, 𐭠 TAW, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 WAW-NUN-AYIN-RESH
<i>bun</i>	<bwn>	beginning	𐭠𐭠 𐭠𐭠	𐭠 BETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 WAW-NUN-AYIN-RESH

<i>gund</i>	<gwnd>	troop, army	𐬒𐬀 𐬒𐬀	𐬒 GIMEL-DALETH-YODH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 WAW-NUN-AYIN-RESH, 𐬒 GIMEL-DALETH-YODH
<i>wan</i>	<wn>	tree	𐬀𐬀 𐬀𐬀	𐬀 WAW-NUN-AYIN-RESH, 𐬀 WAW-NUN-AYIN-RESH
<i>wināh</i>	<wn's>	sin	𐬀𐬀𐬀 𐬀𐬀𐬀	𐬀 WAW-NUN-AYIN-RESH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 ALEPH-HETH, 𐬀 ALTERNATE SAMEKH
<i>rōn</i>	<lwn>	direction	𐬒 𐬒	𐬒 LAMEDH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 WAW-NUN-AYIN-RESH
<i>murw</i>	<mwlw>	bird	𐬒𐬀𐬀 𐬒𐬀𐬀	𐬀 MEM, 𐬀 WAW-NUN-AYIN-RESH, 𐬒 LAMEDH, 𐬀 WAW-NUN-AYIN-RESH
<i>nūn</i>	<K'N>	now (adv.)	𐬀𐬀 𐬀𐬀	𐬀 KAPH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 WAW-NUN-AYIN-RESH
<i>kerbag</i>	<krpk>	good deeds	𐬀𐬀𐬀 𐬀𐬀𐬀	𐬀 KAPH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 PE, 𐬀 WAW-NUN-AYIN-RESH

## 6.8 zayin

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Initial	𐬀	before all letters except those below
	𐬀	before 𐬀 ALEPH-HETH, 𐬒 GIMEL-DALETH-YODH, 𐬀 TAW

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Medial	𐬀	before all letters except those below
	𐬀	before 𐬀 ALEPH-HETH, 𐬒 GIMEL-DALETH-YODH, 𐬀 TAW

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Final	𐬀	after all letters
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<i>az</i>	<'z>	goat	𐬀 𐬀	𐬀 ALEPH-HETH, 𐬀 ZAYIN
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<i>burzāwand</i>	<bwlz'wnd>	lofty, tall	𐭠𐭡𐭣𐭤 𐭠𐭡𐭣𐭤	𐭡 BETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭤 LAMEDH, 𐭠 ZAYIN, 𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 WAW-NUN-AYIN-RESH, 𐭡 GIMEL-DALETH-YODH
<i>ahīy</i>	<KZY>	before (adv.)	𐭠𐭡𐭣 𐭠𐭡𐭣	𐭠 KAPH, 𐭠 ZAYIN, 𐭡 GIMEL-DALETH-YODH
<i>mizd</i>	<mzd>	fee, reward	𐭠𐭡𐭣 𐭠𐭡𐭣	𐭠 MEM, 𐭠 ZAYIN, 𐭡 GIMEL-DALETH-YODH
<i>zarr</i>	<ZHBA>	gold	𐭠𐭡𐭣 𐭠𐭡𐭣	𐭠 ZAYIN, 𐭠 ALEPH-HETH, 𐭡 BETH, 𐭠 ALEPH-HETH
<i>zōd</i>	<zwt>	chief priest	𐭠𐭡𐭣 𐭠𐭡𐭣	𐭠 ZAYIN, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 TAW
<i>zīndag</i>	<zywndk>	living	𐭠𐭡𐭣𐭤 𐭠𐭡𐭣𐭤	𐭠 ZAYIN, 𐭡 GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 WAW-NUN-AYIN-RESH, 𐭡 GIMEL-DALETH-YODH, 𐭠 KAPH
<i>zamānag</i>	<zm'nk>	an appointed time	𐭠𐭡𐭣𐭤 𐭠𐭡𐭣𐭤	𐭠 ZAYIN, 𐭠 MEM, 𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 KAPH

## 6.9 kaph

The letter *kaph* is written using 𐭠 KAPH, but it also has an archaic form 𐭠 that occurs in Aramaic heterograms and historical spellings of words. This latter form is encoded as the separate character OLD KAPH on account of its distinctive shape.



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 Final 9 after all dual-joining letters

 9 after ʾ GIMEL-DALETH-YODH, ʾ mem
 

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<i>akanārag</i>	<ʾknʾlk>	limitless	سواسلو سواسلو	𐭠 ALEPH-HETH, 9 KAPH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 ALEPH-HETH, 𐭡 LAMEDH, 9 KAPH
<i>gyāg</i>	<gywʾk>	place	سو𐭠 سو𐭠	ʾ GIMEL-DALETH-YODH, ʾ GIMEL-DALETH-YODH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 ALEPH-HETH, 9 KAPH
<i>kerbakkar</i>	<krpkk<	someone who does good deeds	𐭡و𐭠و𐭠 𐭡و𐭠و𐭠	9 KAPH, 𐭠 WAW-NUN-AYIN-RESH, 𐭠 PE, 9 KAPH, 9 KAPH, 𐭡 LAMEDH
<i>nāyrīg</i>	<nʾylyk>	adult woman	اسلو اسلو	𐭠 WAW-NUN-AYIN-RESH, 𐭠 FIXED ALEPH-HETH, ʾ GIMEL-DALETH-YODH, 𐭡 LAMEDH, ʾ GIMEL-DALETH-YODH, 9 KAPH
<i>ramag</i>	<lmk>	flock	𐭡 𐭡	𐭡 LAMEDH, 𐭠 MEM, 9 KAPH

### 6.10 ‘old’ kaph











<i>ōh</i>	<KN>	in that manner	𐭠 𐭠	𐭠 OLD KAPH, 𐭠 WAW-NUN-AYIN-RESH
<i>kū</i>	<ʾYK>	that, so that	سو سو	𐭠 FIXED ALEPH-HETH, ʾ GIMEL-DALETH-YODH, 𐭠 OLD KAPH

### 6.11 lamedh

Although palaeographically derived from Aramaic *lamedh*, the letter 𐭪 LAMEDH generally represents /r/ in Book Pahlavi. The letters 𐭪 and 𐭫 represent *lamedh* in Aramaic heterograms. As they occur concurrently and are preserved in historically spellings of words, they are encoded as the separate characters HOOKED LAMEDH and OLD LAMEDH, respectively. When 𐭪 represents /l/ instead of /r/, it is marked with a small stroke as 𐭪. This form is encoded as the letter STROKED LAMEDH.

<i>artēštār</i>	<'ltyšt'l>	soldier, warrior	𐭪𐭪𐭪𐭪𐭪𐭪𐭪 𐭪𐭪𐭪𐭪𐭪𐭪𐭪	𐭪 ALEPH-HETH, 𐭪 LAMEDH, 𐭪 TAW, 𐭪 GIMEL-DALETH-YODH, 𐭪 SHIN, 𐭪 TAW, 𐭪 ALEPH-HETH, 𐭪 LAMEDH
<i>dagr</i>	<dg >	long, long-lasting	𐭪𐭪 𐭪𐭪	𐭪 GIMEL-DALETH-YODH, 𐭪 GIMEL-DALETH-YODH, 𐭪 LAMEDH
<i>didīgar</i>	<dtykl>	second	𐭪𐭪𐭪𐭪 𐭪𐭪𐭪𐭪	𐭪 GIMEL-DALETH-YODH, 𐭪 TAW, 𐭪 GIMEL-DALETH-YODH, 𐭪 KAPH, 𐭪 LAMEDH
<i>yal</i>	<yal>	hero	𐭪𐭪 𐭪𐭪	𐭪 GIMEL-DALETH-YODH, 𐭪 LAMEDH
<i>gōw-</i>	<YMLLWN>	say, speak	𐭪𐭪𐭪𐭪 𐭪𐭪𐭪𐭪	𐭪 GIMEL-DALETH-YODH, 𐭪 MEM, 𐭪 LAMEDH, 𐭪 LAMEDH, 𐭪 WAW-NUN-AYIN-RESH, 𐭪 WAW-NUN-AYIN-RESH
<i>framān</i>	<plm'n>	order, command	𐭪𐭪𐭪𐭪 𐭪𐭪𐭪𐭪	𐭪 GIMEL-DALETH-YODH, 𐭪 GIMEL-DALETH-YODH, 𐭪 LAMEDH

Alternate forms of *lamedh*:

<i>Alaksandar</i>	<'lksndl>	Alexander		א ALEPH-HETH, ל STROKED LAMEDH, א ALTERNATE SAMEKH, ו WAW-NUN-AYIN-RESH, ג GIMEL-DALETH-YODH, ל HOOKED LAMEDH
<i>pas</i>	<'HL>	after, afterwards		א ALEPH-HETH, א ALEPH-HETH, > OLD LAMEDH
				א ALEPH-HETH, א ALEPH-HETH, ל HOOKED LAMEDH
<i>pasih</i>	<'HLyh>	rear		א ALEPH-HETH, א ALEPH-HETH, ל HOOKED LAMEDH, ג GIMEL-DALETH-YODH, א ALEPH-HETH
<i>ma</i>	<'L>	do not (neg. part.)		א ALEPH-HETH, > OLD LAMEDH
				א ALEPH-HETH, ל HOOKED LAMEDH
<i>fradāg</i>	<MHL>	tomorrow		מ MEM, א ALEPH-HETH, > OLD LAMEDH
				מ MEM, א ALEPH-HETH, ל HOOKED LAMEDH
<i>ō</i>	<'L>	to (prep.)		ו WAW-NUN-AYIN-RESH, > OLD LAMEDH
				ו WAW-NUN-AYIN-RESH, ל HOOKED LAMEDH

## 6.12 mem, qoph

The letters *mem* and *qoph* are written using the same shape م. They have the same joining behavior. The letter *qoph* rarely occurs, and only in Aramaic heterograms.

<i>ka</i>	<'MT>	when, if	𐭠𐭡 𐭠𐭡	𐭠 ALEPH-HETH, 𐭡 MEM, 𐭡 TAW
<i>āsmān</i>	<'sm'n>	sky	𐭠𐭡𐭠 𐭠𐭡𐭠	𐭠 ALEPH-HETH, 𐭠 ALTERNATE SAMEKH, 𐭡 MEM, 𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH
<i>būm</i>	<bwm>	land	𐭠𐭡 𐭠𐭡	𐭠 BETH, 𐭠 WAW-NUN-AYIN-RESH, 𐭡 MEM
<i>hamēmāl</i>	<hmym'l>	opponent (in war and law)	𐭠𐭡𐭠𐭡 𐭠𐭡𐭠𐭡	𐭠 ALEPH-HETH, 𐭡 MEM, 𐭠 GIMEL-DALETH-YODH, 𐭡 MEM, 𐭠 ALEPH-HETH, 𐭠 LAMEDH
<i>garmīh</i>	<glmyh>	heat	𐭠𐭡𐭠 𐭠𐭡𐭠	𐭠 GIMEL-DALETH-YODH, 𐭠 LAMEDH, 𐭡 MEM, 𐭠 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH
<i>may</i>	<HML'>	wine	𐭠𐭡𐭠 𐭠𐭡𐭠	𐭠 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH, 𐭡 MEM, 𐭠 KAPH
<i>ĵāmag</i>	<y'mk>	garment, coat	𐭠𐭡𐭠 𐭠𐭡𐭠	𐭠 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH, 𐭡 MEM, 𐭠 KAPH
<i>māh</i>	<m'h>	moon	𐭠𐭡 𐭠𐭡 𐭠𐭡	𐭡 MEM, 𐭠 ALEPH-HETH, 𐭠 ALEPH-HETH
<i>mehmān</i>	<m'hm'n>	guest, intimate	𐭠𐭡𐭠𐭡 𐭠𐭡𐭠𐭡	𐭡 MEM, 𐭠 ALEPH-HETH, 𐭠 ALEPH-HETH, 𐭡 MEM, 𐭠 ALEPH-HETH, 𐭠 WAW-NUN-AYIN-RESH

<i>mardōm</i>	<mltwm>	people	𐭌𐭎𐭕𐭌𐭕 𐭌𐭎𐭕𐭌𐭕	𐭌 MEM, 𐭎 LAMEDH, 𐭕 TAW, 𐭌 WAW-NUN-AYIN-RESH, 𐭌 MEM
<i>mihr</i>	<mtr>	Mithra; love	𐭎𐭕𐭌 𐭎𐭕𐭌	𐭌 MEM, 𐭕 TAW, 𐭌 WAW-NUN-AYIN-RESH
<i>mihr</i>	<mtr>	Mithra; love	𐭎𐭕𐭌 𐭎𐭕𐭌	𐭌 MEM, 𐭕 TAW, 𐭌 WAW-NUN-AYIN-RESH
<i>wārān</i>	<MTLA>	rain	𐭕𐭎𐭕𐭌 𐭕𐭎𐭕𐭌	𐭌 MEM, 𐭕 TAW, 𐭎 LAMEDH, 𐭕 ALEPH-HETH
<i>abar</i>	<QDM>	on (prep.)	𐭕𐭌𐭕 𐭕𐭌𐭕	𐭌 MEM, 𐭕 GIMEL-DALETH-YODH, 𐭌 MEM
<i>abar</i>	<QDM>	on (prep.)	𐭕𐭌𐭕 𐭕𐭌𐭕	𐭌 MEM, 𐭕 GIMEL-DALETH-YODH, 𐭌 MEM
<i>ānōh</i>	<TMH>	there	𐭕𐭕𐭎 𐭕𐭕𐭎	𐭕 TAW, 𐭌 MEM, 𐭕 HE

MEM slopes southwest from the baseline.

<i>sahist</i>	<MDMH-st>	seemed	𐭕𐭕𐭕𐭌 𐭕𐭕𐭕𐭌	𐭌 MEM, 𐭕 GIMEL-DALETH-YODH, 𐭌 MEM, 𐭕 HE
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### 6.13 samekh

The *samekh* is written using the two distinctive forms 𐭕 and 𐭕. These forms are not glyphic variants, but may occur concurrently in a text, and also within a word. The 𐭕 is encoded as SAMEKH, while 𐭕 is encoded as ALTERNATE SAMEKH.

<i>asar</i>	<'sr>	eternal, end- less	سړ سړ	𐭠 ALEPH-HETH, 𐭡 SAMEKH, 𐭣 LAMEDH
<i>hunsand</i>	<hwnsnd>	content	سړسړ سړسړ	𐭠 ALEPH-HETH, 𐭡 WAW-NUN-AYIN-RESH, 𐭣 ALTERNATE SAMEKH, 𐭡 WAW-NUN-AYIN-RESH, 𐭣 GIMEL-DALETH-YODH
<i>rāh</i>	<l's>	road, path	سړ سړ	𐭣 LAMEDH, 𐭠 ALEPH-HETH, 𐭣 ALTERNATE SAMEKH
<i>nask</i>	<nsk>	book of the Avesta	سړسړ سړسړ	𐭡 WAW-NUN-AYIN-RESH, 𐭡 SAMEKH, 𐭣 KAPH
<i>saxt</i>	<sht>	hard, firm	سړسړ سړسړ	𐭡 SAMEKH, 𐭠 ALEPH-HETH, 𐭣 TAW
<i>spāsdār</i>	<sp'sd'l>	grateful	سړسړسړ سړسړسړ	𐭡 SAMEKH, 𐭣 PE, 𐭠 ALEPH-HETH, 𐭣 ALTERNATE SAMEKH, 𐭣 GIMEL-DALETH-YODH, 𐭠 ALEPH-HETH, 𐭣 LAMEDH
<i>sālār</i>	<srđ'l>	leader, chief, governor	سړسړ سړسړ	𐭣 ALTERNATE SAMEKH, 𐭡 WAW-NUN-AYIN-RESH, 𐭣 GIMEL-DALETH-YODH, 𐭣 LAMEDH
<i>pāygōs</i>	<p'tkws>	district	سړسړسړ سړسړسړ	𐭣 PE, 𐭠 ALEPH-HETH, 𐭣 TAW, 𐭣 KAPH, 𐭡 WAW-NUN-AYIN-RESH, 𐭣 ALTERNATE SAMEKH

6.14 pe

<i>ābādīh</i>	<’ptyh>	wealth, prosperity	𐬀𐬎𐬀𐬎 𐬀𐬎𐬀𐬎	𐬀 GIMEL-DALETH-YODH, 𐬀 WAW-NUN-AYIN-RESH, 𐬎 SAMEKH, 𐬀 PE, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 GIMEL-DALETH-YODH
<i>gōspand</i>	<gwspnd>	domestic animal	𐬀𐬎𐬀𐬎 𐬀𐬎𐬀𐬎	𐬀 GIMEL-DALETH-YODH, 𐬀 WAW-NUN-AYIN-RESH, 𐬎 SAMEKH, 𐬀 PE, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 GIMEL-DALETH-YODH
<i>xōb</i>	<hwp>	good	𐬀𐬎 𐬀𐬎	𐬀 ALEPH-HETH, 𐬀 WAW-NUN-AYIN-RESH, 𐬀 PE
<i>pōlābd</i>	<pwl’pt>	steel	𐬀𐬎𐬀𐬎 𐬀𐬎𐬀𐬎	𐬀 PE, 𐬀 WAW-NUN-AYIN-RESH, 𐬎 LAMEDH, 𐬀 ALEPH-HETH, 𐬀 PE, 𐬎 TAW
<i>rēbāh</i>	<lyp’s>	rhubarb	𐬀𐬎𐬀 𐬀𐬎𐬀	𐬎 LAMEDH, 𐬀 GIMEL-DALETH-YODH, 𐬀 PE, 𐬀 ALEPH-HETH, 𐬎 SAMEKH
<i>rabihwintar</i>	< pytpynt >	southern	𐬎𐬀𐬎𐬀𐬎𐬀 𐬎𐬀𐬎𐬀𐬎𐬀	𐬎 LAMEDH, 𐬀 PE, 𐬀 GIMEL-DALETH-YODH, 𐬎 TAW, 𐬀 PE, 𐬀 GIMEL-DALETH-YODH, 𐬀 WAW-NUN-AYIN-RESH, 𐬎 TAW, 𐬎 LAMEDH
<i>paydāg</i>	<pyt’k>	apparent, evident	𐬀𐬎𐬀 𐬀𐬎𐬀	𐬀 PE, 𐬀 GIMEL-DALETH-YODH, 𐬎 TAW, 𐬀 ALEPH-HETH, 𐬎 KAPH

## 6.15 sadhe

<i>ačārag</i>	<'c'lk>	helpless	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭠 ALEPH-HETH, 𐭣 WAW-NUN-AYIN-RESH, 𐭥 GIMEL-DALETH-YODH, 𐭥 LAMEDH, 𐭥 SADHE
<i>handarz</i>	<hndlc>	advice	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭠 ALEPH-HETH, 𐭣 WAW-NUN-AYIN-RESH, 𐭥 GIMEL-DALETH-YODH, 𐭥 LAMEDH, 𐭥 SADHE
<i>nēmrož</i>	<nymlwc>	noon	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭣 WAW-NUN-AYIN-RESH, 𐭥 GIMEL-DALETH-YODH, 𐭥 MEM, 𐭥 LAMEDH, 𐭣 WAW-NUN-AYIN-RESH, 𐭥 SADHE
<i>pērōzgar</i>	<pylwegl>	victorious	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭥 PE, 𐭥 GIMEL-DALETH-YODH, 𐭥 LAMEDH, 𐭣 WAW-NUN-AYIN-RESH, 𐭥 SADHE, 𐭥 GIMEL-DALETH-YODH, 𐭥 LAMEDH,
<i>čarb</i>	<clp>	amenable	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭥 SADHE, 𐭥 LAMEDH, 𐭥 PE
<i>sang</i>	<CCA>	stone	𐭠𐭣𐭥𐭥 𐭠𐭣𐭥𐭥	𐭥 SADHE, 𐭥 SADHE, 𐭠 ALEPH-HETH



## 6.16 shin

<i>ōšībām</i>	<'wšyb'm>	dawn	𐭮𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮𐭮	𐭮 ALEPH-HETH,   WAW-NUN-AYIN-RESH, 𐭮 SHIN, 𐭮 GIMEL-DALETH-YODH,   BETH, 𐭮 ALEPH-HETH, 𐭮 MEM
<i>āštīh</i>	<'štyh>	peace	𐭮𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮𐭮	𐭮 ALEPH-HETH, 𐭮 SHIN, 𐭮 TAW, 𐭮 GIMEL-DALETH-YODH, 𐭮 ALEPH-HETH
<i>xwarišn</i>	<hwlšn>	food	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	𐭮 ALEPH-HETH,   WAW-NUN-AYIN-RESH,   LAMEDH, 𐭮 SHIN,   WAW-NUN-AYIN-RESH
<i>Warkaš</i>	<wlkš>	the world ocean	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	WAW-NUN-AYIN-RESH,   LAMEDH, 𐭮 KAPH, 𐭮 SHIN
<i>mēš</i>	<myš>	sheep	𐭮𐭮𐭮	𐭮 MEM-QOPH, 𐭮 GIMEL-DALETH-YODH, 𐭮 SHIN
<i>šāhān</i>	<š'h'n>	kings	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	𐭮 SHIN, 𐭮 ALEPH-HETH, 𐭮 ALEPH-HETH, 𐭮 ALEPH-HETH,   WAW-NUN-AYIN-RESH,
<i>dēwān</i>	<šDYA'n>	bad gods	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	𐭮 SHIN, 𐭮 GIMEL-DALETH-YODH, 𐭮 GIMEL-DALETH-YODH, 𐭮 ALEPH-HETH, 𐭮 ALEPH-HETH,   WAW-NUN-AYIN-RESH,

<i>weh</i>	<šPYL>	good, better	𐭮𐭮𐭮 𐭮𐭮𐭮	𐭮 SHIN, 𐭮 PE, 𐭮 GIMEL-DALETH-YODH, 𐭮 LAMEDH
<i>Kašmīr</i>	<kšmyl>	Kashmir	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	𐭮 KAPH, 𐭮 SHIN, 𐭮 MEM, 𐭮 GIMEL-DALETH-YODH, 𐭮 LAMEDH
<i>tuxšāg</i>	<twšš'k>	diligent	𐭮𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮𐭮	𐭮 TAW, 𐭮 WAW-NUN-AYIN-RESH, 𐭮 ALEPH-HETH, 𐭮 SHIN, 𐭮 ALEPH-HETH, 𐭮 KAPH

## 6.17 taw

<i>dād</i>	<d't>	law	𐭮𐭮 𐭮𐭮	𐭮 GIMEL-DALETH-YODH, 𐭮 ALEPH-HETH, 𐭮 TAW
<i>zamestān</i>	<dmst'n>	winter	𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮	𐭮 GIMEL-DALETH-YODH, 𐭮 MEM, 𐭮 SAMEKH, 𐭮 TAW, 𐭮 ALEPH-HETH, 𐭮 WAW-NUN-AYIN-RESH
<i>zōd</i>	<zw>	chief priest	𐭮𐭮 𐭮𐭮	𐭮 ZAYIN, 𐭮 WAW-NUN-AYIN-RESH, 𐭮 TAW,
<i>Zarduxšt</i>	<zltwhšt>	Zarathustra	𐭮𐭮𐭮𐭮𐭮 𐭮𐭮𐭮𐭮𐭮	𐭮 ZAYIN, 𐭮 LAMEDH, 𐭮 TAW, 𐭮 WAW-NUN-AYIN-RESH, 𐭮 ALEPH-HETH, 𐭮 SHIN, 𐭮 TAW

<i>pahikār</i>	<ptk'l>	strife	𐭛𐭥𐭥𐭥 𐭛𐭥𐭥𐭥	𐭥 PE, 𐭥 TAW, 𐭥 KAPH, 𐭥 ALEPH-HETH, 𐭥 LAMEDH
<i>tan</i>	<tn>	body	𐭥 𐭥	𐭥 TAW, 𐭥 WAW-NUN-AYIN-RESH

6.18 x1, x2

<i>andar</i>	<BYN>	in (prep.)	𐭥 𐭥	𐭥 x1
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## 7 Description of numbers

### 7.1 Primary units

1	ēk	one	𐬀	𐬀 ONE
2	dō	two	𐬁	𐬁 TWO
3	sē	three	𐬂	𐬂 THREE
4	čahār	four	𐬃	𐬃 FOUR
5	pañ	five	𐬄	𐬃 THREE, 𐬁 TWO
6	šaš	six	𐬅	𐬃 THREE, 𐬂 THREE
7	haft	seven	𐬆	𐬃 FOUR, 𐬂 THREE
8	hašt	eight	𐬇	𐬃 FOUR, 𐬂 THREE
9	nō	nine	𐬈	𐬃 THREE, 𐬂 THREE, 𐬂 THREE

## 8 Character Properties

### 8.1 Core data: UnicodeData.txt

```

10BB0;BOOK PAHLAVI LETTER ALEPH-HETH;Lo;0;R;;;;;N;;;;;
10BB1;BOOK PAHLAVI LETTER BETH;Lo;0;R;;;;;N;;;;;
10BB2;BOOK PAHLAVI LETTER GIMEL-DALETH-YODH;Lo;0;R;;;;;N;;;;;
10BB3;BOOK PAHLAVI LETTER OLD DALETH;Lo;0;R;;;;;N;;;;;
10BB4;BOOK PAHLAVI LETTER HE;Lo;0;R;;;;;N;;;;;
10BB5;BOOK PAHLAVI LETTER WAW-NUN-AYIN-RESH;Lo;0;R;;;;;N;;;;;
10BB6;BOOK PAHLAVI LETTER ZAYIN;Lo;0;R;;;;;N;;;;;
10BB7;BOOK PAHLAVI LETTER KAPH;Lo;0;R;;;;;N;;;;;
10BB8;BOOK PAHLAVI LETTER OLD KAPH;Lo;0;R;;;;;N;;;;;
10BB9;BOOK PAHLAVI LETTER LAMEDH;Lo;0;R;;;;;N;;;;;
10BBA;BOOK PAHLAVI LETTER STROKED LAMEDH;Lo;0;R;;;;;N;;;;;
10BBB;BOOK PAHLAVI LETTER HOOKED LAMEDH;Lo;0;R;;;;;N;;;;;
10BBC;BOOK PAHLAVI LETTER OLD LAMEDH;Lo;0;R;;;;;N;;;;;
10BBD;BOOK PAHLAVI LETTER MEM-QOPH;Lo;0;R;;;;;N;;;;;
10BBE;BOOK PAHLAVI LETTER SAMEKH;Lo;0;R;;;;;N;;;;;
10BBF;BOOK PAHLAVI LETTER ALTERNATE SAMEKH;Lo;0;R;;;;;N;;;;;
10BC0;BOOK PAHLAVI LETTER PE;Lo;0;R;;;;;N;;;;;
10BC1;BOOK PAHLAVI LETTER SADHE;Lo;0;R;;;;;N;;;;;
10BC2;BOOK PAHLAVI LETTER SHIN;Lo;0;R;;;;;N;;;;;
10BC3;BOOK PAHLAVI LETTER TAW;Lo;0;R;;;;;N;;;;;
10BC4;BOOK PAHLAVI LETTER LIGATURE X1;Lo;0;R;;;;;N;;;;;
10BC5;BOOK PAHLAVI LETTER LIGATURE X2;Lo;0;R;;;;;N;;;;;
10BC6;BOOK PAHLAVI LETTER LIGATURE TURNED AHRIMAN;Lo;0;R;;;;;N;;;;;
10BC7;BOOK PAHLAVI COMBINING DOT ABOVE;Mn;230;NSM;;;;;N;;;;;
10BC8;BOOK PAHLAVI COMBINING DOT BELOW;Mn;220;NSM;;;;;N;;;;;
10BC9;BOOK PAHLAVI COMBINING TWO DOTS ABOVE;Mn;230;NSM;;;;;N;;;;;
10BCA;BOOK PAHLAVI COMBINING TWO DOTS BELOW;Mn;220;NSM;;;;;N;;;;;
10BCB;BOOK PAHLAVI COMBINING THREE DOTS ABOVE;Mn;230;NSM;;;;;N;;;;;
10BCC;BOOK PAHLAVI COMBINING THREE DOTS BELOW;Mn;220;NSM;;;;;N;;;;;
10BCD;BOOK PAHLAVI COMBINING HAT ABOVE;Mn;230;NSM;;;;;N;;;;;
10BCE;BOOK PAHLAVI COMBINING HAT BELOW;Mn;220;NSM;;;;;N;;;;;
10BCF;BOOK PAHLAVI END OF WORD MARK;Po;0;AL;;;;;N;;;;;
10BD0;BOOK PAHLAVI PUNCTUATION THREE DOTS;Po;0;AL;;;;;N;;;;;
10BD1;BOOK PAHLAVI PUNCTUATION THREE CIRCLES;Po;0;AL;;;;;N;;;;;
10BD2;BOOK PAHLAVI LETTER FIXED-FORM ALEPH-HETH;Lo;0;R;;;;;N;;;;;
10BD3;BOOK PAHLAVI LETTER FIXED-FORM GIMEL-DALETH-YODH;Lo;0;R;;;;;N;;;;;
10BD4;BOOK PAHLAVI NUMBER ONE;No;0;R;;;;;1;N;;;;;
10BD5;BOOK PAHLAVI NUMBER TWO;No;0;R;;;;;2;N;;;;;
10BD6;BOOK PAHLAVI NUMBER THREE;No;0;R;;;;;3;N;;;;;
10BD7;BOOK PAHLAVI NUMBER FOUR;No;0;R;;;;;4;N;;;;;
10BD8;BOOK PAHLAVI NUMBER ONE HUNDRED;No;0;R;;;;;100;N;;;;;

```

### 8.2 Linebreak data: LineBreak.txt

```

10BB0..10BC6;AL # Lo [23] BOOK PAHLAVI LETTER ALEPH..
                                BOOK PAHLAVI LIGATURE TURNED AHRIMAN
10BC7..10BCE;AL # Cm [8] BOOK PAHLAVI COMBINING DOT ABOVE..
                                BOOK PAHLAVI COMBINING HAT BELOW
10BCF..10BD1;AL # Po [3] BOOK PAHLAVI END OF WORD MARK..
                                BOOK PAHLAVI PUNCTUATION THREE CIRCLES
10BD2..10BD3;AL # Lo [2] BOOK PAHLAVI LETTER FIXED-FORM ALEPH-HETH..
                                BOOK PAHLAVI LETTER FIXED-FORM GIMEL-DALETH-YODH
10BD4..10BD8;AL # No [5] BOOK PAHLAVI NUMBER ONE..
                                BOOK PAHLAVI NUMBER ONE HUNDRED

```

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	10BB	10BC	10BD
0	س 10BB0	س 10BC0	ا 10BD0
1	ر 10BB1	س 10BC1	س 10BD1
2	د 10BB2	س 10BC2	س 10BD2
3	و 10BB3	س 10BC3	س 10BD3
4	س 10BB4	س 10BC4	س 10BD4
5	ا 10BB5	س 10BC5	ر 10BD5
6	س 10BB6	س 10BC6	س 10BD6
7	و 10BB7	س 10BC7	س 10BD7
8	س 10BB8	س 10BC8	س 10BD8
9	ر 10BB9	س 10BC9	س 10BD9
A	س 10BBA	س 10BCA	
B	س 10BBB	س 10BCB	
C	س 10BBC	س 10BCC	
D	س 10BBD	س 10BCD	
E	س 10BBE	س 10BCE	
F	س 10BBF	س 10BCF	

	Book Pahlavi	Psalter Pahlvai	Inscriptional Pahlavi	Inscriptional Parthian	Imperial Aramaic
<i>aleph</i>	𐭀	𐭁	𐭂	𐭃	𐭄
<i>beth</i>	𐭅	𐭆	𐭇	𐭈	𐭉
<i>gimel</i>	𐭊	𐭋	𐭌	𐭍	𐭎
<i>daleth</i>	( <sup>2</sup> ), 𐭏	𐭐	𐭑	𐭒	𐭓
<i>he</i>	𐭔	𐭕	𐭖	𐭗	𐭘
<i>waw</i>	𐭙	𐭚	𐭛	𐭜	𐭝
<i>zayin</i>	𐭞	𐭟	𐭠	𐭡	𐭢
<i>heth</i>	(𐭣)	𐭤	𐭥	𐭦	𐭧
<i>teth</i>	—	—	𐭨	𐭩	𐭪
<i>yodh</i>	( <sup>2</sup> )	𐭫	𐭬	𐭭	𐭮
<i>kaph</i>	𐭯, 𐭰	𐭱	𐭲	𐭳	𐭴
<i>lamedh</i>	𐭵, 𐭶, 𐭷, 𐭸	𐭹	𐭺	𐭻	𐭼
<i>mem</i>	𐭽	𐭾	𐭿	𐮀	𐮁
<i>nun</i>	(𐮂)	𐮃	𐮄	𐮅	𐮆
<i>samekh</i>	𐮇, 𐮈	𐮉	𐮊	𐮋	𐮌
<i>ayin</i>	(𐮍)	—	( <sup>2</sup> )	𐮎	𐮏
<i>pe</i>	𐮐	𐮑	𐮒	𐮓	𐮔
<i>sadhe</i>	𐮕	𐮖	𐮗	𐮘	𐮙
<i>qoph</i>	(𐮚)	—	( <sup>2</sup> )	𐮛	𐮜
<i>resh</i>	(𐮝)	—	( <sup>2</sup> )	𐮞	𐮟
<i>shin</i>	𐮠	𐮡	𐮢	𐮣	𐮤
<i>taw</i>	𐮥	𐮦	𐮧	𐮨	𐮩

Table 1: Comparison of the Pahlavi scripts with Parthian and Aramaic. Parenthesis indicate that a letter has been unified with another in the respective encoding. In Inscriptional Pahlavi, *ayin* and *resh* are unified with *waw*, and *qoph* with *mem*.