# Braille Spec for Cuneiform Transliteration, Compact

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## table Information

This table implements a braille code that was developed collaboratively by a team of students and scholars—including Ray McAllister, Sarah Blake LaRose, Matthew Yeater, and Eric J. Harvey—in collaboration with David Holladay and Caryn navy of Duxbury Systems.

The code is also documented at https://www.duxburysystems.com/documentation/dbt12.5/languages/semitic\_tbl.htm

## Description

This code is optimized for reading the cuneiform languages of ancient Mesopotamia, when they have been transliterated or normalized using Latin characters. It can also handle the transliteration of alphabetic cuneiform and other ancient Middle Eastern languages written with linear alphabets.

## Languages:

Sumerian

Akkadian (Babylonian and Assyrian)

Hittite

Ugaritic

Classical Hebrew

Aramaic (all dialects)

Northwest Semitic dialects (Ammonite, Moabite, etc.)

## Basic Character Definitions

Letters of the Roman alphabet, numerals, and most punctuation are represented as in uncontracted Unified English Braille (UEB).

## Diacritic marks

In braille, diacritic marks precede the base character. Below, the basic pattern is followed by examples of common letters that appear with each diacritic. Examples are representative but not comprehensive.

* ⠆ Acute accent (dots 23): indicates sign #2 in Sumerian and Akkadian and also /s2/
  + ⠆⠁ Á, ⠆⠑ é, ⠆⠊ í, ⠆⠕ ó, ⠆⠥ ú, ⠆⠎ ś
* ⠒ Grave Accent (dots 25): indicates sign reading #3 in Sumerian and Akkadian
  + ⠒⠁ à, ⠒⠑ è, ⠒⠊ ì, ⠒⠕ ò, ⠒⠥ ù
* ⠘ Macron (dots 45): indicates long vowels
  + ⠘⠁ ā, ⠘⠑ ē, ⠘⠊ ī, ⠘⠕ ō, ⠘⠥ ū
* ⠰ Circumflex (dots 56): indicates ultra-long vowels
  + ⠰⠁ â, ⠰⠑ ê, ⠰⠊ î, ⠰⠕ ô, ⠰⠥ û
* ⠷ Breve (dots 12356): indicates reduced vowels
  + ⠷⠁ ă, ⠷⠑ ĕ, ⠷⠊ ĭ, ⠷⠕ ŏ, ⠷⠥ ŭ
* ⠶ Breve below (dots 2356): with *h*, indicates voiceless velar fricative
  + ⠶⠓ ḫ
* ⠐ Dot below (dot 5): marks plosive consonants, except with *h*, where it indicates a voiceless pharyngeal fricative (Hebrew *het*)
  + ⠐⠙ ḍ, ⠐⠓ ḥ, ⠐⠅ ḳ, ⠐⠎ ṣ, ⠐⠞ ṭ
* ⠸ Line below (dots 456): indicates spirantized consonants
  + ⠸⠃ḇ, ⠸⠙ ḏ, ⠸⠅ ḵ, ⠸⠞ ṯ
* ⠳ Hook above (dots 1256): represents vocalized glottal stop/aleph, esp. in Ugaritic
  + ⠳⠁ ả, ⠳⠊ ỉ, ⠳⠥ ủ
  + Also for Ugaritic glottal vowels: ⠳⠁ ꞻ, ⠳⠊ ꞽ, ⠳⠥ ꞿ

## Special characters

Below are special characters and cases where a letter plus diacritic has a single-cell dot pattern.

⠰⠢ ʾ (dots 56-26) Glottal stop/aleph

⠰⠔ ʿ (dots 56-35) Voiced pharyngeal fricative/ayin

⠩ Š (dots 146) esh/shin

⠄ ə (dot 3) Shwa/Shewa

⠄ ǝ (dot 3) turned e (alternative way of representing shwa)

## Punctuation

⠲ . Period

⠤ - Hyphen/dash

⠖ ! Exclamation point

⠐⠣ ( Left parenthesis

⠐⠜ ) Right parenthesis

⠨⠣ [ Left square bracket (begin reconstructed/missing text)

⠨⠜ ] Right square bracket (end reconstructed/missing text)

⠸⠣ { Left brace

⠸⠜ } Right brace

⠈⠣ ⸢ Top left half-bracket (begin partially broken text)

⠈⠜⸣ Top right half-bracket (end Partially broken text)

⠠⠣ ⸤ Bottom left half-bracket (begin partially broken text)

⠠⠜ ⸥ Bottom right half-bracket (end partially broken text)

## Capitalization and Numeric Indicators

⠨ Precedes a single capital letter

⠨⠠ Precedes a capitalized word (e.g., a Logogram in Akkadian)

⠠⠄ End of capitalized word if not interrupted by space or punctuation

⠼ Precedes a numeral (until interrupted by a space or punctuation)

## Superscript and subscript

This table does not indicate superscript or subscript explicitly, though these features of formatting are important for Akkadian and Hittite in particular.

Subscript numerals representing sign readings will appear as regular numerals in braille. Since these will be preceded by the numeral sign, this should cause no confusion. Subscript numerals can be specified in back-translation (see Notes on Back-Translation below).

Superscripted determinatives in Akkadian will also appear as regular text. However, capitalization indicators almost always make it possible to distinguish determinatives from the logographic or syllabic signs around them.

In the majority of cases where a determinative is followed by a logogram, the capital word marker will serve to distinguish the two signs

For example, in gišBANŠUR ⠛⠊⠩⠨⠠⠃⠁⠝⠩⠥⠗, the capital word marker ⠨⠠ separates and distinguishes the superscripted determinative giš from the logogram BANŠUR.

Ambiguity may arise when a determinative follows syllabic transliteration or normalized text. Compare the following cases:

KA.DINGIR.RAki Here the end capitalization marker separates the logogram from the final determinative.

However, in *Bābilim*ki = ⠨⠃⠘⠁⠃⠊⠇⠊⠍⠅⠊ neither the italic of the city name nor the superscript of the determinative is represented in the braille.

## Notes on back translation

While back translation in this table generally works well, it has some idiosyncrasies and may need further refinement.

Across the many and varied real-world sources using print transliteration, the same phonemes and characters can be found represented quite differently. Just as forward-translation represents such cases with the same braille, so back-translation defaults to one Unicode encoding.

Often, characters with diacritic marks can be represented with one or two code points—that is, as the character and diacritic together or as a base character with a combining diacritic. For technical reasons, lowercase letters default to the single code point in Unicode back-translation, whereas capital letters default to two code points. However, many text editors and other apps automatically replace such two-code-point combinations with their single-code-point alternatives.

In print, the glottal stop can be found represented by the IPA glottal stop sign or the “modifier letter right half-ring” character. Back translation defaults to “modifier letter right half-ring.”

Likewise, the voiced pharyngeal fricative can be represented in print with the IPA sign or with the “modifier letter left half-ring” character. Back translation defaults to “modifier letter left half-ring.”

A line under a letter can be represented by Unicode “combining low line” or “combining macron below.” Back translation defaults to “combining macron below.”

Normal and subscript numerals both translate into normal numerals in braille forward-translation, but subscript numerals can be specified in back-translation. In order to do this, each digit of the numeral must be preceded by the dot pattern ⠼⠠. Unlike normal numbers, a single numeral sign will not do.

Thus, ⠼⠁⠃⠉ translates to 123

But ⠼⠠⠁⠼⠠⠃⠼⠠⠉ must be entered for ₁₂₃ (subscript).

Note that this inputs the subscript numeral Unicode characters, not subscript formatting or style.