NesiliKeys Keyboard Layout

NesiliKeys is a keyboard layout for Macintosh OSX designed for easy entry of cuneiform unicode glyphs. Because it is unicode-compliant, it works with any unicode cuneiform font, but has been designed with Hittite cuneiform needs in mind, and the Ullikummi fonts in particular.

I. Installing NesiliKeys

Depending on your preferred keyboard arrangement, drag `NesiliQWERTY.keylayout,` `NesiliQWERTZ.keylayout,` or `NesiliAZERTY.keylayout` into the Keyboard Layouts folder in your `Library` folder. Under the `Apple` menu, go to `System Preferences ... Language & Text` and then click on `Input Sources`. A `Nesili` keyboard should appear in the list. Check the box to activate the keyboard. If you have not done so, make sure the box in the lower right hand corner that says 'Show Input menu in menu bar' is checked. This will put a menu at the top of your screen near the right which will allow you to move from one keyboard layout to another. You can also choose keyboard shortcuts for switching from one keyboard layout to another by clicking on `Keyboard Shortcuts` in the same frame.

After dragging the keylayout file into `Keyboard Layouts`, restart any applications which you were running if you want to use the NesiliKeys keyboard layout in them. (If you don't, NesiliKeys will do nothing in that application).

II. Using NesiliKeys

Nearly all the cuneiform glyphs commonly used in Hittite texts can be chosen through a series of one to three keystrokes, called here an *autocode*. Most cuneiform signs have multiple autocodes in NesiliKeys, reflecting multiple ways of transcribing signs ('sign values'). For example the sign with the conventional *sign-name* KI has a multiplicity of potential sign-values, and these each have their own autocodes:

𒆠 = `ki.` (*ki*, KI), `gi5` (*gi*$_5$, GI$_5$), `ge5` (*ge*$_5$, GE$_5$), `ke.` (*ke*)

In addition, many sign-values correspond to sequences on cuneiform glyphs. With NesiliKeys typing the autocode of these signs will give the appropriate sequence, e.g.:

KISLAḪ 𒆠𒌓 `kl` (= KI.UD)   KARAŠ 𒆠𒃲𒁁 `kr` (=KI.KAL.BAD)
GUNNU 𒆠𒉈 `gn` (= KI.NE)   SUR7 𒆠𒆕 `sv7` (= KI.GAG)

In the present version (v. 2.0) there are 1020 autocodes available, representing well over 900 distinct sign-values. As a result, many currently deprecated sign values will still have a corresponding autocode in NesiliKeys, so it is should not usually be necessary to normalize old transcriptions when inputting texts.

In addition, 234 sign values which are used for (non-Hittite) Sumerian texts have autocodes in NesiliKeys (see **Appendix I** in this document). Note, however, that Hittite does not make use of the full inventory of Sumerian/Akkadian signs. Only those signs which are normally used in Hittite texts have autocodes in NesiliKeys.

To start using NesiliKeys right away, read the **Quick Start Summary** on the following page. For further details, read the **Extended Explanation of Autocodes** pp. 3–12. For a list of all codes assigned to sign-values, open the file **NesiliKeysCodeList.pdf**.

Quick Start Summary of Regular Coding Conventions

1 All codes contain at most three letters or numbers, no more than two consonants, and, except for Hurrian syllabograms, no more than one vowel.
2 One- or two-letter codes ending in vowels or `v` (= 'ur') are followed by a period.
3 For indices on codes ending in vowels or `v`, the index number is added *instead of* a period.
4 For consonant-final codes: for index 2, *capitalize* the final consonant; for index 3, press the *option key* with the consonant; for index 4 or higher, press *both shift and the option key*.

Numerals: 1-9: type the digit. For 10, type `0`. For multiples of ten: shift and the digit at once.

Hittite Syllabograms or Monosyllabic Ideograms

5 Type the syllable: `kur` ⊀, `it` ⊠. Use `h` for *ḫ: ḫal* `hal` ⊢; use `c` for Š/Š in ideograms.
6 If the syllable ends in a vowel, also add a period: `a.` ⊤, `la.` ⊟, `nu.` ⊢
7 Use either `s` or `c` for Hittite *š* = [s] – except for *sa/ša* and *nis/niš* (always `ca.` and `nis`)
9 Indexed syllables ending in vowels: type the syllable followed by the numerical index: *pí* `pi2` ⊠, *pè* `pe3` ⊢, *ni₅* `ni5` ⊠. For index 10, type `0`; for indices higher than 10 type `1`.
10 Indexed syllables ending in consonants:
   a. for index 2, type the last letter in capitals: *kúl* `kuL` ⊠
   b. for index 3, type the last letter with the option key: *gàr* `ga opt-r` ⊠
   c. for index 4 or higher, type the last letter with both option and shift depressed: *in₄* `i opt-shift n` ⊠

Polysyllabic Ideograms

11 Beginning with a vowel (or with a consonant and containing *at most two consonants*): type the first two (resp. three) letters of the sign-value with the final letter in capitals if the sign name is unindexed OR if it has index 2. For higher indices, follow 10b-c above.
   (C)VCV($_2$) → (c)v `shift-c`, e.g. UTU `uT` ⊀, DUMU `duM` ⊨, GÉME `geM` ⊀
   (C)VCV$_3$ → (c)v `opt-c`, (C)VCV$_{4+}$ → (c)v `opt-shift-c`
12 Beginning with UR: type `v` instead of `ur`: URI `vi.` ⊞, URU$_5$ `vu5` ⊀.
13 Beginning with a consonant and containing three or more consonants: type the initial consonant of the first two syllables: GEŠTIN `gt` ⊠. For index 2, capitalize the final letter NÍGIN `nG` ⊢; for index three use option: PÀSAN `pa opt-s` ⊠; for index four or higher, use both option and shift: KISIM$_5$ `k option-shift-s` ⊠.

Hurrian syllabograms: Type the first three letters of the syllable (incl. subscripts). For *wi$_{ip}$* ⊠ use `wip`, for *wi$_{pi}$* ⊠ use `wiP`, and for *wu$_ú$* ⊠ use `wuU`.

Complex ideograms beginning with KA×: Type `kx` followed by the first letter of the following sign-name: KA×LUM `kxl` ⊠, KA×UR$_2$ `kxV` ⊠ (with `V` = UR$_2$)

Irregular codes and substitutions: About 100 of the rarer sign values either lack their own codes and must be entered with the code for a different sign-value, or have slightly irregular codes. See §8.

Special codes: DINGIR `d.` ⊢ ; Glossenkeil `l.` ⊀ (sc. 'Luwian').

Extended Explanation of Autocodes

1. Numerals

Glyphs representing numerals can be entered with a single keystroke:

a. Numerals 1-9: simply type the *numeral*. For 10, type 0.

1𒁹 2𒈫 3𒐈 4𒐉 5𒐊 6𒐋 7𒐌 8𒐍 9𒐎 0𒌋

b. 11 = `shift-1` 𒌋𒁹.

The remaining *shift* + *numeral* combinations are for multiples of ten:

`shift-2` 𒌋𒌋	(20)	`shift-5` 𒐐	(50)
`shift-3` 𒌍	(30)	`shift-6` 𒐕	(60)
`shift-4` 𒐏	(40)	`shift-7` 𒐗	(70)

2. Structure of Autocodes

The remaining glyphs require from two to three keystrokes and conform to the following generalizations:

a. No autocode contains more than two consonant letters (with the exception of x standing for 'times' in certain complex signs, §6)

b. No autocode begins with a captial letter.

c. No autocode contains more than one vowel letter `a`, `e`, `i`, `u` (`o` is not used). For exceptions for Hurrian syllabograms, see section §7).

d. Autocodes ending in a vowel letter or `v` require a period (`.`) after them to indicate the end of the code.

e. The following autocodes consist of a single consonant followed by a period:

`d.` = 𒀭 = DINGIR
`l.` = 𒑱 = Glossenkeil (sc. 'Luwian')
`v.` = 𒌨 = UR

('v' functions generally here as an optional abbreviation for UR)

f. Generally speaking a sign-value index ($_2$, $_3$, $_4$, $_5$ ...) is indicated by:

i. after *monosyllabic signs ending in a vowel*, type the numeral of the index

ii. *otherwise*:

index 2 → capitalize final letter of the code (press *shift*)

index 3 → type final letter of the code with the *option* key depressed

index 4 or higher → type final letter of the code with both *shift and option* key

3. Monosyllabic Sign Values

Aside from those mentioned above, *nearly all glyphs which are ordinarily used to represent Hittite words* (transcribed conventionally in lower-case) can be activated by simply typing the letters of the syllable, if it ends in a consonant, or the letters of the syllable followed by a period (`.`) if it ends in a vowel. For example:

a.　`a` 𒀀 *a*　`ar` 𒅈 *ar*　`ka.` 𒅗 *ka*　`bal` 𒁄 *bal*　`ya.` 𒅀 *ya*

The only exception is the use of *be* for *bi* in Hittite: here `bi.` must be typed. (See also §3c on *s* vs. *š*):

be → *bi*　`bi.` 𒁉　　　　　　　　(`be.` is reserved for BE 𒁁)

Sumerograms and Akkadograms whose sign values conform to the restrictions in §2a-c are also usually obtained simply by typing their names:

`bir` 𒉉 BIR　　　　`gam` 𒃵 GAM　　　　`tuk` 𒅚 TUK

a. For vowel-final sequences with a subscript (or accented vowel), simply add the appropriate number (acute accent = 2, grave = 3, recall also that 10 = 0), for example:

`da2` 𒁕 *dá*　　　`he2` 𒄭 *hé*　　　`ne2` 𒉈 *né*　　　`du0` 𒁺 DU_{10}

`pa3` 𒉺 *pà*　　　`pe3` 𒁉 *pè*　　　`de4` 𒁲 de_4　　　`ru3` 𒊒 *RÙ*

`zu9` 𒍪 ZU_9　　`u3` 𒌋 *Ù*　　　`a3` 𒀉 *À*

Since an index of 1 is otherwise superfluous, its presence in an autocode implies an index of 10 or higher, for example:

`du1` 𒂀 DU_{11}　　`li1` 𒇷 li_{12}　　`nu1` 𒉡 NU_{11}　　`ce1` 𒊺 $ŠE_{12}$

`u1` 𒌋 U_{19}　　　`si1` 𒋛 SI_{22}　　`se1` 𒊺 SE_{24}

b. h is used for *ḫ*

`ah` 𒄴 *aḫ*　　　　`har` 𒄯 *ḫar*　　　　`hi.` 𒄭 *ḫi*

c. For glyphs used to spell Hittite words, either **s** or **c** can be used for *s/š*.

dis, dic, tis, tic	𒁹	*diš/dis, tis/tiš*
lis, lic	𒁹	*lis/liš*, LIŠ
mes, mec	𒈨𒌍	*mes/meš*, MEŠ
sa2, ca2	𒊭	*sá/šá*, ŠA, *ŠÁ*
sah, cah	𒊩	*saḫ/šaḫ*, ŠAḪ
sar, car	�	*sar/šar*, SAR, ŠAR
su., cu.	𒋗	*su/šu*, ŠU
su2, cu2	𒋠	*sú/šú*, ŠÚ
sum, cum	𒋢	*sum/šum*, *ŠUM*	etc.

(Three exceptions to this rule are treated in §3d.)

In Sumerograms or Akkadograms with Š or *Š*, **c** should ordinarily be used:

cad 𒊓 *ŠAD*	ce3 𒂊 ŠÈ	cub 𒋫 ŠUB	gic 𒄑 GIŠ
mec 𒈨𒌍 MEŠ	cec �šeš ŠEŠ	cem 𒊺𒀭 ŠEM	cim 𒊺𒀭 ŠIM
kuc 𒋢 KUŠ	cen 𒊺𒂗 ŠEN	ced 𒊺 ŠED	cid 𒊺 ŠID
cit 𒊺 ŠIT	rac 𒊏 RAŠ	ca3 𒐼 ŠÀ	muc 𒈲 MUŠ
huc 𒄷𒍑 ḪUŠ			

d. In a three cases the choice between **c** and **s** is meaningful because two distinct Sumerian (Akkadian) words occur, one with Š and the other with S:

i. 𒋛 *si/ši*, ŠI ci.
    𒋛 *sí/ší* (*šé/sé*), SI si. OR ci2 OR ce2

ii. 𒊓 *sa/ša*, ŠA ca.
     𒊓 SA sa.

iii. �niš *niš/nis* nis
      𒐉 NIŠ, *NIŠ* nic

Note that here the autocode follows the logogram value (**c** for Š, **s** for S).

4. For Hittite syllables or Akkadogram and Sumerogram sign values which end in a consonant and have a numerical index (or accent), *a change is made to the final letter of the autocode* to indicate the indexed variant. Note that these principles are entirely general and apply equally to polysyllabic indexed forms (on which, see §5).

The following equivalences are used:

a. Index = 2 (or acute accent): final letter of autocode is *capitalized*:

uR ⟨sign⟩ *úr,* ÚR	piD ⟨sign⟩ *píd*	tuL ⟨sign⟩ *túl*
siG ⟨sign⟩ SÍG	peC ⟨sign⟩ PÉŠ	taK ⟨sign⟩ *ták*
niS ⟨sign⟩ *nís*	kuR ⟨sign⟩ KÚR	iD ⟨sign⟩ ÍD
aB ⟨sign⟩ ÁB	teC ⟨sign⟩ TÉŠ	aG ⟨sign⟩ ÁG(A)
aC ⟨sign⟩ AŠ	laM ⟨sign⟩ LÁM	

b. Index = 3 (or grave accent): the final letter of the autocode is typed with the *option key* down:

du opt-r ⟨sign⟩ DÙR	ta opt-s ⟨sign⟩ *tàs*
ba opt-d ⟨sign⟩ BÀD	tu opt-r ⟨sign⟩ TÙR
ba opt-r ⟨sign⟩ BÀR	ce opt-r ⟨sign⟩ ŠÈR
gu opt-b ⟨sign⟩ GÙB	si opt-p ⟨sign⟩ *sìp*
la opt-h ⟨sign⟩ LÀḪ	sa opt-l ⟨sign⟩ SÀL(A)
la opt-l ⟨sign⟩ LÀL	si opt-l ⟨sign⟩ SÌLA
di opt-m ⟨sign⟩ DÌM	gu opt-n ⟨sign⟩ GÙN
pe opt-c ⟨sign⟩ PÈŠ	tu opt-m ⟨sign⟩ TÙM
sa opt-m ⟨sign⟩ ŠÀM	e opt-n ⟨sign⟩ ÈN (= LI)
e opt-r ⟨sign⟩ ÈR	ma opt-n ⟨sign⟩ MÀN
a opt-r ⟨sign⟩ ÀR	se opt-d ⟨sign⟩ SÈD
a opt-m ⟨sign⟩ ÀM	

c. Index = 4 or higher (including index 'x'). The final letter of the autocode is typed with the *option and the shift keys down*:

cu opt-shift-r ⟨sign⟩ $\check{S}UR_4$	gi opt-shift-r ⟨sign⟩ GIR_4
ki opt-shift-r ⟨sign⟩ KIR_{14}	si opt-shift-r ⟨sign⟩ SIR_4
du opt-shift-g ⟨sign⟩ DUG_4	si opt-shift-g ⟨sign⟩ SIG_4
ta opt-shift-g ⟨sign⟩ TAG_4	la opt-shift-h ⟨sign⟩ $LA\underline{H}_4$
u opt-shift-l ⟨sign⟩ UL_4	di opt-shift-m ⟨sign⟩ $DIM_4,$
u opt-shift h ⟨sign⟩ $U\underline{H}_7$	ku opt-shift-n ⟨sign⟩ KUN_4
su opt-shift-r ⟨sign⟩ SUR_7	mu opt-shift-r ⟨sign⟩ MUR_7
u opt-shift-s ⟨sign⟩ US_5	ka opt-shift-s ⟨sign⟩ $KA\check{S}_4$
ba opt-shift-r ⟨sign⟩ BAR_7	bi opt-shift-r ⟨sign⟩ BIR_9
mu opt-shift-d ⟨sign⟩ MUD_4	u opt-shift-z ⟨sign⟩ UZ_6
ta opt-shift-n ⟨sign⟩ tan_x	

5. Polysyllabic Logograms

Since the values for these signs usually contain more than three letters, certain abbreviatory conventions are adopted for their autocodes. For the purposes of these conventions, polysyllabic sign-values are divided into three classes:

a. Consonant-initial polysyllabic sign-values with 3 or more consonants
b. Consonant-initial polysyallbic sign-values with 2 consonants
c. Vowel-initial polysyllabic sign-values

These three classes are discussed individually below.

a. Consonant-initial polysyllabic sign-values with 3 or more consonants

i. For consonant-initial sign-values with 3 or more consonants but no accented vowels or index, the autocode is normally *the first consonant of the word followed by the first consonant of the second syllable*.

bl 𒌋 BALAG	cc 𒌋 ŠUŠANA	gz 𒌋 GARZA
cn 𒌋 ŠINIG	zb 𒌋 ZABAR	tb 𒌋 TIBIRA
gp 𒌋 GEŠPU	dg 𒌋 DUGUD	mc 𒌋 MUŠEN
gc 𒌋 GAŠAN	gd 𒌋 GIDIM	kr 𒌋 KARAŠ
gl 𒌋 GILIM	cg 𒌋 ŠAGAN	lt 𒌋 LAḪTA
gr 𒌋 GURUN	gt 𒌋 GEŠTIN	zr 𒌋 ZARAḪ
nk 𒌋 NUSKA	gg 𒌋 GALGA	bb 𒌋 BABBAR
gm 𒌋 GAMUN	tk 𒌋 TUKUL	kc 𒌋 KIŠIB
ks 𒌋 KISAL	lb 𒌋 LIBIR	lg 𒌋 LUGAL
ng 𒌋 NIMGIR	nd 𒌋 NINDA	ps 𒌋 PISAN
sh 𒌋 SUḪUR	mg 𒌋 MURGU	mn 𒌋 MUNUS
nn 𒌋 NUNUZ	sl 𒌋 SALIM, SILIM	bc 𒌋 BANŠUR
bh 𒌋 BAḪAR(Ì)	kk 𒌋 KASKAL	mk 𒌋 MAŠKIM
ck 𒌋 ŠUKUR	sk 𒌋 SISKUR	mh 𒌋 MUḪALDIM
gb 𒌋 GIBIL	gs 𒌋 GISSU	gn 𒌋 GUNNI
dh 𒌋 DALḪAMUN	nm 𒌋 NUMUN	nt 𒌋 NITAḪ
lm 𒌋 LAMMA	bp 𒌋 BAPPIR	

ii. For polysyllabic words containing three or more consonants and an index (or, equivalently, an accented vowel), the same principles are applied as for monosyllabic words ending in consonants (§4).

α. **Index = 2** (or acute accent): final letter of autocode is *capitalized*:

`bG` 𒁹 BÚGIN	`gB` 𒐕 GÉŠBU
`nD` 𒐕 NÍNDA	`gP` 𒐕 GÉŠPU
`sS` 𒐕 SI×SÁ	`cM` 𒐕 ŠÁMAN
`tK` 𒐕 TÚKUR	`nS` 𒐕 NÍSABA
`cN` 𒐕 ŠU.NÍGIN	`lM` 𒐕 LÍMMU
`dL` 𒐕 DÍLIM	`lG` 𒐕 LÚGUD
`nG` 𒐕 NÍGIN	`sK` 𒐕 SÍSKUR (= SISKUR.SISKUR)
`kR` 𒐕 KÚRUN	

β. **Index = 3** (or grave accent): the final letter of the autocode is typed with the *option key* down:

`p opt-s` 𒐕 PÀSAN	`p opt-r` 𒐕 PÀRIG
`b opt-l` 𒐕 BÙLUG	`c opt-d` 𒐕 ŠÙDUL = ŠÙDUN

γ. **Index = 4 or higher**. The final letter of the autocode is typed with the *option and the shift keys down*:

`k option-shift-s` 𒐕 KISIM$_5$
`m option-shift-r` 𒐕 MURUB$_4$

b. Consonant-initial polysyllabic sign-values with only 2 consonants

i. For non-indexed sign-values OR those with index 2, the autocode is normally *the first two letters of the sign-value followed by the third letter capitalized*.

`duM` 𒐕 DUMU	`duR` 𒐕 DÚR(U)	`niT` 𒐕 NÍTA
`beL` 𒐕 *BELU*	`tuK` 𒐕 TUKU	`geM` 𒐕 GÉME
`naG` 𒐕 NAGA	`qaT` 𒐕 *QĀTU*	
`siP` 𒐕 SIPA	`muR` 𒐕 MÚRU	

ii. For sign-values indexed 3, again the same principle applies as in §4. The final consonant of the autocode is types with the option-key pressed:

`na opt-t` 𒐕 NÀTA	`da opt-r` 𒐕 DÀRA
`sa opt-l` 𒐕 SÀLA	`a opt-k` 𒐕 ÀKA

iii. Similarly, for sign-values indexed 4 or higher, the final letter is typed with both the option and shift keys pressed:

`du opt-shift-r` 𒁺 DUR(U)$_5$ `bu opt-shift-r` 𒂟 BURU$_6$
`mu opt-shift-n` 𒈾𒈾 MUNU$_8$ `ki opt-shift-c` 𒆧𒅗 KIŠI$_{16}$
`gu opt-shift-d` 𒄢 GUDU$_{12}$

c. Polysyllabic sign-values beginning with a vowel.

i. For non-indexed sign-values OR those with index 2, the abbreviation is *the initial vowel followed by the first consonant capitalized*.

`aL` 𒀩 ALAM   `aM` �ama AMA   `aP` 𒀳 APIN
`aZ` 𒀀𒍣 AZU   `eM` 𒅠 EME   `eR` 𒂗 ÉRIN
`iG` 𒅆 IGI   `iN` 𒅗 INIM   `eS` 𒂩 ÉSAG
`iK` 𒅂 IKU   `iT` 𒌇 ITI, ITU   `iZ` 𒄫 IZI
`uB` 𒅬 UBUR   `uD` 𒌓 UDU   `uG` 𒅗 UGU
`uK` 𒌔 UKU   `uM` 𒅓 UMBIN   `uN` 𒃴 UNU, UNUG
`uZ` 𒊻 UZU   `eD` 𒂔 EDIN   `uT` 𒌓 UTU
`iC` 𒈹 *IŠTAR*   `aN` 𒀲 ANŠE = ANŠU

ii. For sign-values indexed 3, again the same principle applies as in §4. The final letter of the autocode is typed with the option key down.

`u opt-c` 𒁹 ÙŠU   `a opt-k` 𒀉 ÀKA
`u opt-m` 𒅥 ÙMMEDA

iii. Similarly, for sign-values indexed 4 or higher, the final letter is typed with both the option and shift keys pressed:

`u opt-shift-t` 𒌅 UTUL$_5$ `a opt-shift-r` 𒅈 ARAḪ$_4$
`e opt-shift-z` 𒂍 EZEN$_4$

d. Abbreviation of UR as v

i. As mentioned in §2e, the abbreviation **v** may be used for the sign-value letters UR. Normally any code which contains `ur` has a variant form in which **v** may *optionally* be typed in place `ur`. Examples:

`v./ur` 𒌨 UR   `hv./hur` 𒄯 *ḫur*   `tv./tur` 𒌉 TUR
`dv./dur` 𒄙 *dur*   `kv./kur` 𒆳 *kur*   `cv./cur` 𒋩 ŠUR
`bv./bur` 𒁓 *bur*   `mv./mur` 𒄯 *mur*

ii. For indexed sign-names ending in UR or URU, there are two options.

First, the same principles as in §5a(ii) also available for **v**; that is, **V** indicates index 2; `opt-v` indicates index 3, and `opt-shift-v` indicates index 4:

`dV/duR` 𒁾 DÚR(U) `mV/muR` 𒄙 MÚRU
`tV/tuR` 𒌉 TÚR `kV/kuR` 𒄥 KÚR
`k opt-v/ku opt-r` 𒄥 KÙR `t opt-v/tu opt-r` 𒌅 TÙR
`b opt-v/bu opt-r` 𒁓 BÙR = BURÙ
`c opt-shift-v/cu opt-shift-r` 𒋩 ŠUR$_4$
`gu opt-shift-r/ g opt-shift-v` � GUR$_4$

Alternatively, one may type **v** for UR and then the number of the index:

`dv2` 𒁾 DÚR(U) `mv2` 𒄙 MÚRU `kv2` 𒄥 KÚR
`bv3` 𒁓 BÙR = BURÙ `gv4` 𒄥 GUR$_4$ `cv4` 𒋩 ŠUR$_4$
`kv3` 𒄥 KÙR `tv3` 𒌅 TÙR

For indices greater than 4, one should *always* type **v** for UR and then the number of the index (0 again = 10, cf. §2a for vowel-final monosyllables):

`gv0` 𒄝 GUR$_{10}$ `sv1` 𒋩 SUR$_{14}$ `bv1` 𒁓 BUR$_{14}$
`dv0` 𒁾 DUR$_{10}$ `gv1` 𒄘 GURU$_{21}$ `dv5` 𒁹 DUR$_5$
`sv7` 𒋩 SUR7 `mv7` 𒄙 MUR7 `bv6` 𒁓 BURU$_6$

iii. Instead **ur** of **v** must also be used when UR(U) begins a polysyllabic sign name:

`vi.` 𒌷 URI `vu.` 𒌷 URU `vd, vud` 𒍐 URUDU
`vc` 𒌷 URAŠ `vt` 𒌷 URTA `vu5, v5` 𒌷 URU$_5$

iv. Medial UR(U).
A few sign-values with medial URU or UR also have codes with **v**:

KURUŠ 𒆪 `kvc` DURUN 𒁺 `dvn` (also `dr`)
GURUŠ 𒄖 `gvc` GURUN 𒄢 `gvn` (also `gr`)

6. Complex signs containing KA×

A substantial number of cuneiform glyphs involve KA×. For these sign-names, the abbreviation `kx` is used, followed by the first letter of the enclosed glyph (the name after the ×). Capitalization, the option key, and the abbreviation v are used as appropriate:

`kxV`	KA×UR$_2$	`kxm`	KA×ME
`kxp`	KA×PA	`kxn`	KA×NUN
`kxl`	KA×LUM	`kxs`	KA×SA
`kxg`	KA×GIŠ	`kxa`	KA×A
`kx opt-a`	KA×AŠ$_3$	`kxu`	KA×U
`kxc`	KA×ŠE	`kxN`	KA×NÍD (= KA×GAR)
`kxb`	KA×BAR		

Note that KA×LI and KA×UD do not have autocodes. For these one must use an alternate sign-value:

KA×LI → TU$_6$ `tu6`   KA× UD → ZU$_9$ `zu9`

7. Hurrian syllabograms

Hurrian syllabograms require special codes, shown below; in all cases except wi_{pi} the code is simply the first three letters of the normal sign-value. For wi_{pi} and $wu_{\acute{u}}$ the final letter is capitalized, following the convention set out in §5bi. Analogous capitalization in the other codes is optional.

`waa`	wa_a	`wii`	wi_i
`wuu`	wu_u	`gee`	ge_e
`wuU`	$wu_{\acute{u}}$	`wiP`	wi_{pi}
`wuP`	wu_{pu} (or `wup`)	`wip`	wi_{ip}
`neE`	$n\acute{e}_e$ (or `nee`)		

8. Irregular Codes.

In about 100 cases — usually uncommon or deprecated sign-values — the codes assigned do not follow the rules discussed above or the sign-name lacks its own code and the code of another sign-name denoting the same glyph must be used.

Users may wish to keep this list handy when using NesiliKeys.
A full list of autocodes appears in the file **NesiliKeysAutocodeList.pdf.**
In that list, irregular autocodes are indicated by a following asterism ⁂, and the arrow → indicates sign-values for which an autocode is not available, and which therefore must be entered with the autocode of a different sign-value.

Irregular Code List

ÁB×A `a opt-b`

ABUL → KÁ.GAL `ka2gal`

AGRIG → IGI.DUB `iGdub`

ALIM `a opt-l`

AMAR `a opt-shift-m`
 (or → MÁR `maR`)

AMAR×KU₆ `aK`

AMBAR → SUG `sug`

AN/AN → *nab* `nab`

ARA₅ → ḪAR.ḪAR `harhar`

ÀRAḪ → ARAḪ₄ `a opt-shift-r`

Ph. *ás, áz* → ÁŠ `aC`

AŠ₃ → 6 `6`

AŠGAB `a opt-c`

AZAG → KUG.AN `kugan`

ÁZLAG `a opt-z` (or → TU₉ `tu9`,
 TÚG `tuG`, or GI₇ `gi7`)

BAR₈ → BURU₁₄ `bv1`

be → *bi* `bi.`

DAGAL `daG` (or → AMA `aM`)

DAG.KISIM₅×A.MAŠ `da opt-shift-g` (= E!KISIM5×A.MAŠ)

DAG.KISIM₅×LA → LAḪTA `lt`

(*di* when = *ti* → `ti.`)

DILI → DIDLI `dl`

ELAM → DÀḪ `da opt-h`

ÉLLAG → BIR `bir`

ENGAR → APIN `aP`

ENGUR `eV`

ENSI → EN.ME.LI `enme.li.`

ÉR → A.IGI `a.iG`

EREŠ → NIN `nin`

ERI₁₁ → UNU `uN`

ÉRIM → NE.RU `ne.ru.`

ÉRIN → ERIM `eR`

ERIN, EREN `rn`

(ERUM → ARAD `aR`)

ESI `e opt-s` (or → KAL `kal`)

EŠ₅ → THREE.DIŠ `3`

GABA → GAB `gab`

GALA → UŠ.KU `ucku.`

GEŠTU(G) → *wa* `wa.`

GIDRU → PA `pa.`

GIGIR `gi opt-g`

GÍN (TÙN = DÙNgunugunu) `du o-n`
 or `tu o-n`

GÌRA → *GIBIL6* `g os-b` (or NE.GI
 `ne.gi.`)

GIR₁₅ → TÚG `tuG`

GIŠKIM → IGI-DUB `iGdub`

GUD₈ → ḪAB `hab`

GUŠKIN `guC` = KUG.GI
 `kuggi.`

I.A `ya.`

IÁ → FIVE.DIŠ `5`

IÀ → Ì `i3`

IA₄ → NA₄ `na4`

IDIGNA `i opt-d`

ÍLDAG → A.AM `a.am`

ILLAT → KASKAL.KUR `kkkur`

ILLIMU → 9 `9`

INNANA, INNIN `i opt-n` (or →
 MAŠ. GU₂.GAR₃ `macgu2ga opt-r`)

(*is/iš* when = *es/eš* → `es` or `ec`)

IṢ `iS`

IŠIB `i opt-c` (or → ME `me.`)

ISKIM → IGI-DUB `iGdub`

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KA×GAR → KA×NÍG `tu6` ⬚
KA×LI → TU$_6$ `tu6` ⬚
KA×UD → ZU$_9$ `zu9` ⬚
KALA(G) → KAL `kal` ⬚
KIR$_4$ → KA `ka.` ⬚
(kir$_8$ → kar `kar` ⬚)
KIRI$_6$ → SAR `sar` ⬚
KISIM$_5$×Ú-MAŠ ⬚ `k opt-s`
KUN$_5$ → TUR.TÚG `turtuG` ⬚
LAGAB ⬚ `lag` (or → LÚGUD `lG`, NÍ-GIN `nG`, RIN `rin`, ḪAB `hab`)
LAGAB×SUM → ZAR `zar` ⬚
LAGAR ⬚ `lr`
Hurr. li$_{13}$ → GIBIL `gb` ⬚
LIMMU → FOUR.DIŠ `4` ⬚
LUNGA ⬚ `lun` (or → ŠEM `cem` or ŠIM `cim`)
(mi when = mé → `me2` ⬚)
NAGAR ⬚ `nr`
NIDABA ⬚ `niD`
NÍDABA → NAGA `naG` ⬚
NIGA or NIGU ⬚ `nig` (or → ŠE `ce.`)
NIMIN (40) → `niM` or `shift-4` ⬚
NIN$_5$ → HI `hi.` ⬚
NINNU (50) → FIVE.U `shift-5` ⬚
niš → nis `nis` ⬚
NITA → NITAḪ `nt` ⬚
NUNDUM or NUNDUN ⬚ `nuD`
 (or → KA×NUN `kxn`)
SÁ → DI `di.` ⬚
SAḪAR ⬚ `saH`
(sam → šam `cam` ⬚)
(se$_{20}$/še$_{20}$ → lì `li3` ⬚)

ŠAR → LUGAL ⬚ `lg`
ŠENNUR ⬚ `ceN` (or → KIB `kib`)
si (when = lì) → ši `ci.` ⬚
SIG$_5$ → IGI-ÉRIN `iGeR` ⬚
SIG$_7$ ⬚ `si7`
SIG$_{17}$ → GI `gi.` ⬚
SIKIL ⬚ `sik` (or → EL `el`)
SIR → SUD `sud` ⬚
(sir$_9$/šir$_9$ → sar `sar` ⬚)
SU, SU → KUŠ `kuc` ⬚
ŠUBUR → ŠAḪ `cah` ⬚
SUKKAL ⬚ `suK` (or → LÀḪ `la`
 `opt-h`)
SULLIM ⬚ `suL`
SUM(U) → ŠÚM `cuM`
SUMUN → SUN `sun` or BAD `bad` ⬚
TIBULA ⬚ `tiB` (or → ŠA$_3$.A.TAR
 `ca3a.tar`)
UDUN → U.MU `u.mu.` ⬚
UGA → Ú.^{TE}TÈ.GA `u2te.te3ga.`
 ⬚
UGULA → PA `pa.` ⬚
UKKIN ⬚ `u opt-shift-k`
 (or → KA×BAR `kxb`)
ÙKU → UN `un` ⬚
ÚKUŠ ⬚ `u opt-k`
USDUḪA → U$_8$.UDU.ḪÁ `u8uDha2`
 ⬚
ÚTUL `u opt-t` ⬚ (or → TU$_7$ `tu7`)
USSU → EIGHT.DIŠ `u` ⬚
ÚZU ⬚ `u opt-z` (or → AZU `aZ`)
ZIMBIR → BURANUN `br` or
 UD.KIB.NUN `udkibnun` ⬚

APPENDIX 1. Additional sign values

Although no attempt here is made to provide full coverage of Sumerian or Akkadian sign-values, the following additional codes are available for sign-values not typically employed in Hittite texts.

| HZL	sign-value	autocode	ETCL sign name (Forrer sign name)	glyph
316	a_{12}	a1	UD	
5	$aš_7$	a os-c	ŠIR	
56	ba_4	ba4	GA_2	
13	ba_9	ba9	BAD	
357	ba_{13}	ba o-1	ME	
237	ban_3	ba o-n	TUR	
237	$banda_3$	b o-d	TUR	
243	$barag_2$	bR	DAG	
153	be_2	be2	BI	
72	be_3	be3	NI	
205	be_4	be4	BA	
317	be_6	be6	PI	
169	be_7	be7	NE	
317	bi_3	bi3	PI	
206	bid_3	bi o-d	KU	
316	bir_2	biR	UD	
244	biš	bic	HAgunu (HA_6)	
153	biz	biz	BI	
180	bu_4	bu4	LAGAB×U (TÚL)	
206	bu_7	bu7	KU	
257	$buluĝ_3$	b o-l	PAP.PAP (BÙLUG)	
225	$buluĝ_5$	b os-l	BALAG	

55	buniĝ₂	bN	LAGAB×GAR (BÚGIN)
193	buru₇	bv7	GURUN
75	da₃	da3	KAK
90	dab₂	daB	TAB
253	dalla	dl	MAŠ.GU₂.GAR3 (IDIGNA)
71	dar₃	da o-r	DARA₃
169	de₃	de3	NE
32	de₅	de5	RI
128	de₆	de6	DU
37	de₉	de9	TI
98	dehi₂	deH	UM
74	dehi₃	de o-h	NIM
37	di₃	di3	TI
237	di₄	di4	TUR
206	dib₂	diB	KU
337	did	did	IM
72	dig	dig	NI
1	dil	dil	AŠ
275	du₇	du7	U.GUD (*ul*)
335	dub₃	du o-b	HI
334	dubur	db	HI×ŠE (BIR)
180	dul₂	duL	LAGAB×U (TÚL)
125	dum	dum	TUM
339	dur₇	dv7	BU
46	dur₉	dv9	DUN
121	eĝ₃	e o-g	NINDA₂×NE (ÁG)
121	em₃	e o-m	NINDA₂×NE (ÁG)
162	epir	eP	DUG
301	er₈	e os-r	GIR₃

97	eš$_3$	e o-c	AB	
61	ga$_3$	ga3	GAN$_2$	
161	ga$_6$	ga6	IL$_2$	
133	ga$_{14}$	ga1	KA	
45	ganam$_4$	g os-n	LAGAB×GUD+GUD (U$_8$)	
288	ge$_8$	ge8	IGI	
258	gel	gel	GI%GI (GILIM)	
128	ĝen	gen	DU	
194	gi$_2$	gi2	KID	
288	gi$_8$	gi8	IGI	
258	gib	gib	GI%GI (GILIM)	
258	gil	gil	GI%GI (GILIM)	
146	ĝili$_3$	gi o-l	KA×LI (MU$_7$)	
165	gin$_7$	gi os-n	DIM$_2$	
132	ĝiš$_3$	gi o-c	DUB$_2$	
17	ĝu$_{10}$	gu1	MU	
343	gub$_2$	guB	LI	
310	gum$_2$	guM	LUM	
310	gun$_5$	gu os-n	LUM	
161	gur(u)$_3$	gv3	IL$_2$	
247	gur$_2$	gv2	GAM	
315	gur$_8$	gv8	TEgunu	
162	gurun$_7$	gv os-n	DUG	
180	hab$_2$	haB	LAGAB×U (TÚL)	
300	has$_4$	ha os-s	ZUM	
335	he	he.	HI	
75	henbur	hb	KAK	
174	hendur	hd	PA	
106	hir	hir	KEŠ$_2$	

260	hul$_3$	`hu o-l`	GIŠ%GIŠ (KIB)
198	huluh	`hl`	LUH
310	huz	`huz`	LUM
121	iĝ$_3$	`i o-g`	NINDA$_2$×NE (AG$_2$)
8	il$_3$	`i o-l`	AN
128	im$_4$	`i os-m`	DU
239	imma$_3$	`i o-m`	IGIgunu (SIG$_7$)
229	iri	`iR`	URU
97	is$_3$	`i o-s`	AB
178	iš$_6$	`i os-c`	GIŠ
148	kab$_3$	`ka os-b`	KA×A (NAG)
167	kan$_4$	`ka os-n`	KA$_2$
231	kas$_7$	`ka os-s`	ŠID
30	ke$_2$	`ke2`	GI
30	ki$_2$	`ki2`	GI
227	kid$_2$	`kiD`	TAK$_4$
47	kiĝ$_2$	`kiG`	KIN
339	kim$_3$	`ki o-m`	BU
179	kir$_3$	`ki o-r`	LAGAB
190	kisim$_2$	`kS`	DAG.KISIM$_5$×SI
128	ku$_x$	`kux`	DU
128	kub	`kub`	DU
169	kum$_2$	`kuM`	NE
174	kum$_x$	`ku os-m`	PA
174	kun$_2$	`kuN`	PA
7	kur$_5$	`kv5`	TAR
293	kur$_7$	`kv7`	IGIR.ERIN$_2$
295	kurum$_6$	`kv os-m`	PAD
162	kurun$_3$	`kv o-n`	DUG

128	kur$_x$	`kvx`	DU	
72	le$_2$	`le2`	NI	
169	lem$_4$	`le os-m`	NE	
169	li$_9$	`li9`	NE	
19	lib	`lib`	LUL	
288	lib$_4$	`li os-b`	IGI	
72	lid$_2$	`liD`	NI	
115	lillan	`ll`	LUGAL	
260	lirum$_3$	`l o-r`	GIŠ%GIŠ (KIB)	
19	lu$_5$	`lu5`	LUL	
19	lub	`lub`	LUL	
210	lug	`lug`	LU	
56	ma$_3$	`ma3`	GA2	
155	mar$_2$	`maR`	AMAR	
20	mas	`mas`	MAŠ	
317	me$_8$	`me8`	PI	
357	men$_2$	`meN`	ME	
296	men$_5$	`me os-n`	U.U (= H. *man*)	
212	mu$_4$	`mu4`	TUG$_2$	
174	mu$_6$	`mu6`	PA	
174	mudru	`mr`	PA	
212	mur$_{10}$	`mv0`	TUG$_2$	
79	muš$_5$	`mu os-c`	ŠEŠ	
148	na$_8$	`na8`	KA×A (NAG)	
122	naĝa$_4$	`na os-g`	GUM×ŠE (GAZ)	
212	nam$_2$	`naM`	TUG$_2$	
179	ni$_{10}$	`ni0`	LAGAB	
369	ni$_3$	`ni3`	GAR	
310	num$_2$	`nuM`	LUM	

328	nus	nus	NUNUZ	
317	pa$_{12}$	pa1	PI	
256	pa$_4$	pa4	PAP	
295	pa$_x$	pax	PAD	
292	pad$_3$	pa o-d	IGI.RU (IGI-RU)	
24	pag	pag	HU	
19	pah	pah	LUL	
228	par$_4$	pa os-r	KISAL	
169	pel	pel	NE	
244	peš	pec	HAgunu (HA6)	
133	pi$_4$	pi4	KA	
169	pil	pil	NE	
327	pir$_2$	piR	ERIN$_2$	
231	pisaĝ$_2$	pS	ŠID	
296	puzur$_2$	pz	U.U (man)	
159	qa$_2$	qa2	GA	
240	qar	qar	GAR$_3$	
120	qum	qum	GUM	
115	rab$_3$	ra o-b	LUGAL	
229	re$_2$	re2	URU	
236	re$_7$	re7	DU/DU (LAḪ$_4$)	
204	ri$_5$	ri5	NUN/NUN (NIR)	
196	rib	rib	KAL	
300	rig$_2$	riG	ZUM	
32	rig$_5$	ri os-g	RI	
129	rim$_4$	ri os-m	DUDšešig (KAŠ$_4$)	
40	ru$_{12}$	ru1	EN	
366	sa$_3$	sa3	ZA	
20	sa$_9$	sa9	MAŠ	

174	sag$_3$	sa o-g	PA	
169	sahar$_x$	s os-h	NE	
350	si$_3$	si3	SUM (ŠÚM)	
174	sig$_3$	si o-g	PA	
269	sim$_x$	si os-m	GIG	
11	sir$_5$	si os-r	NU	
79	sis	sis	ŠEŠ	
209	su$_2$	su2	ZU	
341	su$_3$	su3	SUD	
236	su$_8$	su8	DU/DU (LAH$_4$)	
236	sub$_2$	suB	DU/DU (LAH$_4$)	
91	sub$_6$	su os-b	TAG	
339	sud$_4$	su os-d	BU	
236	sug$_2$	suG	DU/DU (LAH$_4$)	
341	sug$_4$	su os-g	SUD	
127	suku$_x$	su os-k	LIL	
333	sur$_3$	su o-r	HI×AŠ$_2$ (HAR)	
333	sur$_3$	sv3	HI×AŠ$_2$ (HAR)	
358	suru$_5$	sv5	LAL	
72	suš$_2$	suC	NI	
81	ša$_5$	ca5	AK	
46	šah$_2$	caH	DUN	
192	šak	cak	SAG	
63	še$_8$	ce8	ŠEŠ$_2$	
239	še$_x$	cex	IGIgunu (SIG$_7$)	
154	šembi$_2$	cB	ŠIM	
154	šembizid	cb	ŠIM	
204	šer$_7$	ce os-r	NUN/NUN (NIR)	
62	šes$_4$	ce os-s	EREN	

95	šika	ciK	LA	
34	šilam$_x$	c os-l	NUN.LAGAR (TÚR)	
261	šu$_4$	cu4	U	
88	šudu$_{14}$	c os-d	DUB$_3$gunugunušešig (ŠÙDUL)	
251	šuš$_2$	cuC	ŠU$_2$	
83	tar$_2$	taR	DAR	
71	tara	tr	DARA$_3$	
249	teĝ$_3$	te o-g	TE	
249	temen	tm	TE	
249	ten	ten	TE	
315	ten$_x$	te os-n	TEgunu (URU$_5$)	
37	tiĝ$_4$	ti os-g	TI	
1	til$_4$	ti os-l	AŠ	
204	tir$_x$	ti os-r	NUN/NUN (NIR)	
50	tu$_{10}$	tu0	HUB2×U (HUB)	
212	tuba$_x$	tu os-b	TUG2	
346	tud	tud	TU	
91	tuku$_5$	tu os-k	TAG	
128	tum$_2$	tuM	DU	
346	tur$_5$	tv5	TU	
339	tur$_8$	tv8	BU	
114	u$_9$	u9	EZEN×BAD (BÀD)	
180	ub$_4$	u os-b	LAGAB×U (TÚL)	
260	ul$_3$	u o-l	GIŠ%GIŠ (KIB)	
114	un$_3$	u o-n	EZEN×BAD (BÀD)	
40	uru$_{16}$	vu1	EN	
109	uruda	vD	URUDA	
174	u$_x$	ux	PA	
317	wi	wi.	PI	

238	zak	`zak`	ZAG	
99	zamug	`zm`	DUB	
72	zar_2	`zaR`	NI	
196	zi_8	`zi8`	KAL	
36	zil	`zil`	NUN	
91	zil_2	`ziL`	TAG	
46	zu_7	`zu7`	DUN	
146	zug_4	`zu os-g`	KA×LI (MU_7)	
155	zur	`zur`	AMAR	