

# Proposal to Encode Proto-Cuneiform

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## Contents

<b>Acknowledgements</b>	<b>2</b>
<b>1 Summary</b>	<b>2</b>
<b>2 Previous Proposals</b>	<b>3</b>
<b>3 The Archaic Period in Mesopotamia</b>	<b>3</b>
3.1 Birth of Cities . . . . .	3
3.2 History . . . . .	4
3.3 Major Text Corpora . . . . .	4
3.3.1 Administrative Texts . . . . .	5
3.3.2 Lexical Lists . . . . .	7
3.4 Writing Phases . . . . .	8
3.5 Vocabulary . . . . .	8
<b>4 Rationale for Separately Encoding Proto-Cuneiform</b>	<b>8</b>
4.1 ED I-II Excluded from the Proposal . . . . .	11
4.1.1 PC signs in ED I-II . . . . .	12
<b>5 Materials for Encoding Proto-Cuneiform</b>	<b>12</b>
5.1 Texts . . . . .	13
5.1.1 The Print Corpus . . . . .	13
5.1.2 The Digital Corpus . . . . .	13
5.1.3 PCSL Corpus . . . . .	14
5.1.4 PC25 Corpus . . . . .	14
5.2 Signs . . . . .	14
5.2.1 Grapheme Distribution . . . . .	14
5.2.2 PCSL Corpus Grapheme Distribution . . . . .	15
5.3 Lists . . . . .	15
5.3.1 Historic Lists . . . . .	15
5.3.2 The Intended Standard List . . . . .	15
5.3.3 Revisionist Lists . . . . .	15
5.3.4 The Digital List . . . . .	16
5.3.5 The Oracc List . . . . .	16
5.3.6 Sign Lists and Prior PC Proposals . . . . .	16
5.3.7 Sign List Cautions . . . . .	16
5.4 Coverage . . . . .	17

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<b>6 Principles for Encoding</b>	<b>17</b>
6.1 (Non-)Contrastive Usage . . . . .	17
6.1.1 (Non-)Contrastive Usage in Complex and Compound Signs . . . . .	18
6.2 Sequences . . . . .	18
6.3 Principles . . . . .	18
6.4 Advantages of the Revised Approach . . . . .	19
6.5 Reference Glyphs . . . . .	19
6.6 More on Sequences . . . . .	20
6.6.1 Sequences are not encoded . . . . .	20
6.6.2 Opaque sequences are not encoded . . . . .	20
6.6.3 Reasons for Exceptions . . . . .	20
6.6.4 List of Exceptions . . . . .	20
<b>7 Proposal Documents</b>	<b>21</b>
7.1 Code Charts . . . . .	22
7.2 Character List . . . . .	27
<b>References</b>	<b>45</b>

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Michael Everson, Laura Hawkins and Debbie Anderson carried out and fostered work on Proto-Cuneiform for Unicode under the auspices of the Script Encoding Initiative [L2/16-267; L2/17-157; L2/19-284]. More recently, Anshuman Pandey laid the basis for the current proposal in several important proposal documents of his own [L2/20-193; L2/22-239; L2/23-190].

Steve Tinney authored the bulk of the current proposal and created the Oracc PCSL project [Tin24], the digital corpus (based on CDLI) and resources from which the appendices are derived.

Robin Leroy authored the section “Rationale for Separately Encoding Proto-Cuneiform” and frequently shared his expertise on cuneiform, Unicode, and LaTeX.

The PCSL font was initially created by Anshuman Pandey based on Bob Englund’s collection of signs and was an essential basis for the current proposal. The font was revised and augmented by Steve Tinney.

## 1 Summary

This is a new proposal to encode 1392 ‘Proto-Cuneiform’ ([ISO15924] Pcusn) characters in Unicode. These characters belong to the earliest attested writing system, which emerged at the end of the 4th millennium BCE in Uruk, a region between the Tigris and Euphrates rivers, in what is commonly referred to as Mesopotamia.

Proto-Cuneiform is a pictographic script, with symbols etched or pressed onto clay surfaces. This writing system was used initially for administrative and accounting purposes. Over time, these pictographs were replaced with more abstract signs, which are known as ‘cuneiform’ ([ISO15924] Xsux). Accordingly, this ancestral writing system is known as ‘proto-cuneiform’. The ‘Sumero-Akkadian Cuneiform’ and ‘Early Dynastic Cuneiform’ blocks in Unicode cover most of the Xsux cuneiform repertoire.

Apart from the source materials, Proto-Cuneiform signs are depicted in scholarly publications, both in tables and in running text. Currently, these signs are displayed using images or fonts mapped to other script blocks due to the absence of a Unicode encoding. The aim of this proposal is to encode in Unicode a well-defined repertoire that will enable the representation of Proto-Cuneiform characters in plain text.

## 2 Previous Proposals

This proposal supersedes the following documents:

- [L2/16-267] = L2/16-267: “Preliminary proposal to encode Proto-Cuneiform in the SMP” (Everson & Hawkins)
- [L2/17-157] = L2/17-157: “Proposal to encode Proto-Cuneiform in the SMP of the UCS” (Everson & Hawkins)
- [L2/19-284] = L2/19-284: “Proposal to Encode Proto-Cuneiform in the SMP of the UCS” (Hawkins)
- [L2/20-193] = L2/20-193: “Preliminary proposal to encode Proto-Cuneiform in Unicode” (Pandey)
- [L2/22-239] = L2/22-239: “Revised proposal to encode Proto-Cuneiform in Unicode” (Pandey)
- [L2/23-190] = L2/23-190: “Revised proposal to encode Proto-Cuneiform in Unicode” (Pandey)

This revision supersedes recommendations made by Stephen Tinney in the following document related to the composition of the scholarly and Unicode repertoires:

- [L2/24-211] = L2/24-211: “Comments on L2/23-190 Revised proposal to encode Proto-Cuneiform in Unicode”

Most numerical signs have been moved to:

- [L2/24-210] = L2/24-210: “Archaic Cuneiform Numerals” (Leroy)

Major changes and enhancements from the previous proposal (L2/23-190) include:

- A revised set of principles on which the encoding is based
- Alignment of the encoding with established disciplinary practices
- Use of all available published and digital data for Proto-Cuneiform rather than sole reliance on the CDLI-gh collection of sign images
- Several hundred previously encoded characters are treated as non-contrastive variants, following disciplinary standards, and are not encoded separately
- Over two hundred previously encoded characters are treated as sequences and are not encoded separately.

## 3 The Archaic Period in Mesopotamia

Proto-cuneiform script was invented in the second half of the third millennium BCE and used until the early part of the second millennium BCE, approximately 3500–2900 BCE, generally known as the Archaic Period. This period was extensively described and discussed, with special reference to texts and writing, by the late Robert K. Englund in his magisterial book-within-a-book “Texts from the Late Uruk Period” [Eng98]. The following sketch is based largely on Englund’s discussion to which the reader is referred for a detailed account.

### 3.1 Birth of Cities

The flourishing of urbanization in southern Mesopotamia during the fourth millennium BCE gave rise to several major centres of which the best known and most excavated is that of Uruk. Major institutional buildings, new artistic forms illustrating the importance of the ruler and the relationship of the ruler and the gods, and the invention of writing are all features of socio-political developments in the first cities.

Networks of canals connected important centres and the distribution of material culture and writing show that the world of the Archaic Uruk period was characterized by significant interaction between communities, not only within southern Mesopotamia but in “Uruk enclaves” in the Susiana plain of modern Iran and in modern Syria and Türkiye where Uruk architecture, visual arts, and administrative systems indicate the presence of Uruk colonies for trading or resource extraction [Alg93; Alg05].

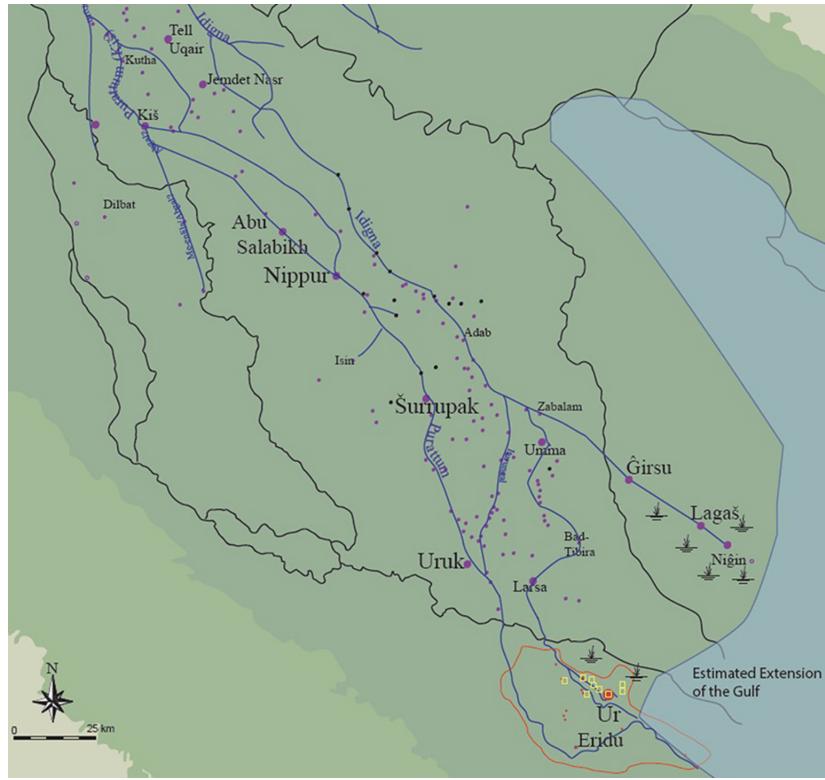


Figure 1: Map of southern Iraq showing canal networks and key settlements of the late fourth and early third millennia BCE (from [Ben15])

### 3.2 History

We cannot write a political history of the late fourth millennium, and the lack of archaeological context for key Uruk period textual finds means that we must resort to dating the tablet finds by relative paleographical criteria rather than by documented archaeological findspots.

The sporadic nature of both archaeological excavations and text corpora is another impediment to a continuous history of these early periods, as Algaze notes in his excellent synthesis of the Uruk period primarily from the archaeological perspective [Alg13]. Algaze reviews the surface survey data, excavations, and (in less detail) the textual finds from all parts of the Uruk world and presents a coherent picture of a cyclical efflorescence and decline of major cities in the south each with their own networks of smaller settlements in a hierarchy up to four levels deep. In addition, as mentioned above, there is extensive evidence of relatively far-flung colonial outcrops. Considering the extent of these hundreds of settlements active, albeit often episodically or intermittently, over five to six hundred years, the text-corpus of less than 7000 documents from a handful of sites presumably only represents a small subset of the ancient textual material generated and, in some cases, still awaiting excavation.

### 3.3 Major Text Corpora

Figure 2 provides a schematic overview of the sequence of major text finds in the ‘Writing Phase’ column. The entry ‘Clay bullae and numerical tablets’ in the Writing Phase column is the equivalent of the periodic classification Uruk V. Only small groups of texts are omitted from the subsequent Late Uruk (Uruk IV and Uruk III) into the Jemdet Nasr period (examples include Uqair, Larsa). For ED I-II we have the ED I-II Ur texts [Bur35; LV13]; a few tablets from Uruk which are later than archaic [Gre82]; and some tablets from Fara that are earlier than ED IIIa [Kre14]. Then the record is silent until Fara (Šuruppak) [Kre98].

The largest and most important group of archaic texts was excavated in the city of Uruk. The tablets were found

	Period	Writing Phase	Historical Developments
3400		Clay bullae and numerical tablets	Beginning of large-scale settlement of Babylonia
3300			
3200	Late Uruk	Archaic texts from Uruk: Writing Phase Uruk IV,	First urban centers
3100		Writing Phase Uruk III	Age of early civilization
3000	Jemdet Nasr		
2900			
2800	Early Dynastic I	Archaic texts from Ur	
2700			Formation of large irrigation networks
2600	Early Dynastic II	Texts from Fara	
2500			Rival city-states
2400	Early Dynastic III	Old Sumerian texts	
2300	Dynasty of Akkad	Old Akkadian texts	First regional state
2200			
2100	Gudea of Lagash Ur III	Neo-Sumerian texts	Centralized state of the 3rd Dynasty of Ur
2000			

Figure 2: Chronological overview of early Mesopotamia from [Eng98, p. 23]

in secondary context, meaning that the relative dating of tablets to Uruk IV or the later Uruk III is not based on stratigraphy but on formal and palaeographic features. About 100 tablets and bullae are assigned to the Uruk V period which precedes Uruk IV by an uncertain amount of time. The Uruk period text corpus is described in more detail in section 5.1.

As Englund demonstrates the archaic text corpus reflects organized agriculture, animal husbandry, and other production. The documents evidence social hierarchy and specialization, including the birth of scribal culture in early Mesopotamia.

### 3.3.1 Administrative Texts

The bulk of the archaic tablets are administrative documents. They exhibit varying degrees of complexity from simple tags or one-transaction memos to multi-transactional summaries with a relatively complex organization of cases as indicated in figures 3 and 4.

A number of studies have analysed subgroups of the administrative texts, with the result that the content and methodologies of the archaic accounting records are well understood.

An early example is Margaret Green's work on animal husbandry [Gre80], which is complemented by Englund's work on dairy metrology [Eng91] and production [Eng95a] and the herding of pigs and other animals [Eng95b], as well as J. Cale Johnson's essays on butchering [Joh16] and ritual meat distribution [Joh19].

Other studies have examined grain accounting [Eng01] and time designations [Eng88, p. XXX]. One of the earliest dossiers of activity of a named individual, Kušim the brewer, is studied by Peter Damerow and Bob Englund in [DE93].

In another important contribution with far-reaching implications, Englund also forged new paths in the identification of personal names of labourers—probably captured slaves—in a small group of tablets from Uruk and Umma [Eng09].

This form of spatial division of the tablets into cases which are often quite narrow gives rise to an important

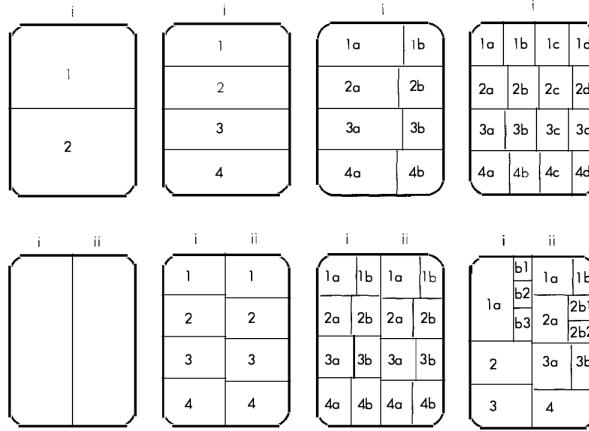


Figure 3: Sample tablet organizations; the CDLI transliterations utilize dotted line numbers to address cases of the form 1a.b2 etc.

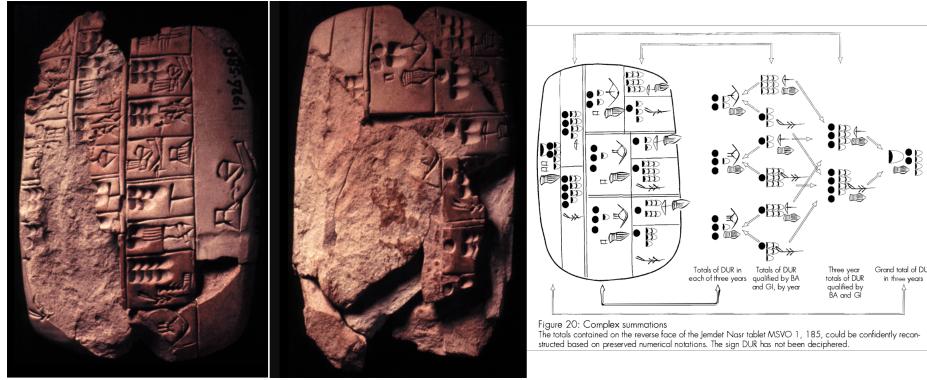


Figure 4: The complex summation MSVO 1, 185 with Englund's analysis.

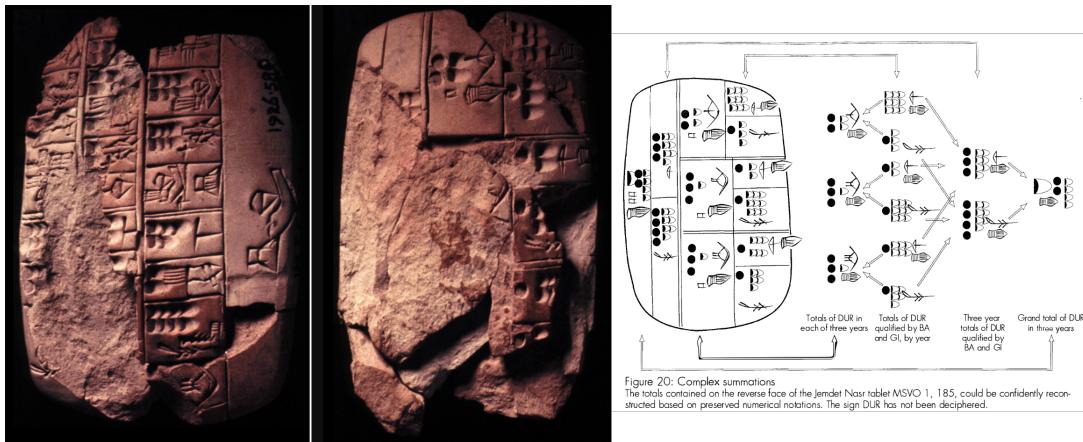


Figure 5: The complex summation MSVO 1, 185 with Englund's analysis.

feature of the writing of combinations of signs, which may be placed beside, above, or otherwise near each other as space permits, and may be written in varying order depending partly on the space available in the box into

which the signs have to fit.

### 3.3.2 Lexical Lists

The other important—but numerically far fewer—group of texts are the word lists that Assyriologists generally refer to as ‘Lexical Texts’. These appear in the earliest phases of writing and are especially well evidenced in Uruk III texts. Importantly, many of these lexical lists continue into the Early Dynastic period, where manuscripts from Fara and Abu Salabikh write the same content but in contemporary cuneiform. This provides the best evidence for the alignment of PC and SAC, but an account of these alignments is beyond the scope of Unicode.

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Figure 6: Englund’s composite of the professions/occupations list, Lu. Shaded areas are entries that cannot be fully reconstructed from the extant manuscripts.

The disciplinary practice with lexical lists, which are attested mostly in small fragments containing only a few lines of the text, is to create composites which allow for an overview of the list and in which each individual entry is evidenced by one or more manuscripts. A sample composite is given in the figure above, and examples of lexical tablets are below.



Figure 7: Sample lexical tablets: P000006, P000011, P000025

### 3.4 Writing Phases

The precise analysis of writing phases in the Uruk texts is hampered by the lack of tablet finds in primary archaeological context. The general assumption is that earlier sign forms are more curved; have a greater variety of angles; or are drawn with a pointed stylus rather than being constructed of cuneiform strokes. Englund's discussion of this is accompanied by a figure which is unfortunately absent from the PDF of the book; his Figure 22 is reproduced here..

### 3.5 Vocabulary

The language of the archaic corpus is uncertain: many would accept that it is Sumerian, but for Englund and others this remains stubbornly unprovable. Despite this, continuities between PC and later cuneiform, contextual inferences drawn from counting and measuring systems, and the similarity of some signs to the objects they picture all combine to allow the general sense of many signs or groups of signs to be divined. Two of Englund's figures are chosen here to illustrate this point, but the entirety of "Texts from the Late Uruk Period" is in a sense his demonstration that the archaic corpus—contrary to what some might think—is increasingly well understood.

## 4 Rationale for Separately Encoding Proto-Cuneiform

At the meeting of the Initiative for Cuneiform Encoding in 2000, it was determined that “the encoding of proto-cuneiform is initially, but not necessarily ultimately, beyond the purview of the project cuneiform encoding” [L2/00-398]. When the principles for encoding the cuneiform script were set out in [L2/03-162], the question of unification with the script of the archaic period was left open.

The initial scope of the encoding covered the cuneiform script as used from the Ur III period through the first millennium, although a few distinctions only apparent in the Early Dynastic period, such as IM vs. NI<sub>2</sub>, and a few characters used only in the Early Dynastic period, such as ZAM<sub>x</sub> (ELles 396), were also captured in the initial encoding in Unicode Version 5.0. The scope of the cuneiform script was expanded two and a half centuries back in time in Unicode Version 8.0 with the addition of the Early Dynastic Cuneiform block, based on the Early Dynastic IIIa repertoire in [Dei22]; see the proposal [L2/12-208].

At first glance, it may therefore seem possible to expand the scope of the cuneiform script further to the fourth millennium. The expansion of the glyptic range would be minor compared to its current extent; consider the variety of glyphs for U+1214B CUNEIFORM SIGN IL, from Early Dynastic IIb to Old Babylonian and Neo-Assyrian . Indeed the glyphs of some proto-cuneiform signs would lie within the glyptic range of some archaizing Early Dynastic inscriptions: compare the sign LAK500 or on the shoulder of the ED IIb statue of [P222640] with the reference glyph proposed for U+12860 PROTO-CUNEIFORM

## The Nature of Proto-Cuneiform and the Sumerian Question – Research of proto-cuneiform

	Uruk IV	Uruk III	Uruk IV	Uruk III			
1	DUG <sub>b</sub>						
	DUG <sub>a</sub>		Pots			Chief Administrators	
	DUG <sub>c</sub>						
	KAS <sup>x</sup> <sub>a</sub>						
	AB <sub>a</sub>		Sea <sup>?</sup>			Gods <sup>?</sup>	
2	GU <sub>4</sub>		Oxen			NUN	
	AMAR		Calves			GURUSH	
	ŠAH <sub>2</sub>		Pigs			Inanna	
	BU <sub>a</sub>		Snakes			Nights	
	SAG		Men			Stars	
3	TUR		Children			Milk buckets	
4						Gl <sub>b</sub>	
						AN	
						GA <sub>a</sub>	

Figure 22: Paleographic differences  
The table demonstrates some of the graphic developments between the Uruk IV and III periods. 1: straightening of oblique lines; 2: abstraction of pictograms; 3: simplification of elements, standardization of sign orientation; 4: varia

	Sex Age	Females	Males
Wool Sheep	Adults	Ug 	UDUNITA a b c
	Juveniles	SLA <sub>a</sub> c	KR <sub>11</sub>
			SILANITA
Fatted Sheep (?)			GUUKAI  a b  c
	Adults	UD <sub>2</sub> 	MAŠ <sub>2</sub>
Gods	Juveniles	EŠGAR	MAŠ

SMALL CATTLE: SHEEP AND GOATS  
UDU  
 a  
 b  
 c

Figure 9: Signs for ovi-caprids, after Englund.

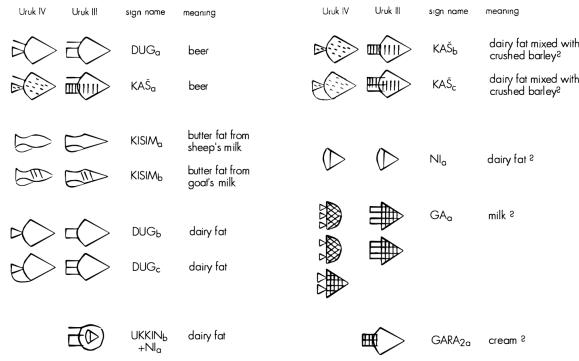


Figure 60: Probable archaic designations of liquid and semi-liquid products

Figure 10: Signs for dairy products, after Englund.

## SIGN IL.

This impression of unifiability is reinforced by the treatment of the Uruk and Jemdet Nasr forms as another column in the diachronic [LL95], and the concordances with [Dei22] and multiple Sumerian readings for each sign given in [GN87, pp. 167–346], as in any other cuneiform sign list.

However, a discontinuity in the approach to sign identity in proto-cuneiform appears in [GN87, pp. 347 sqq.]. Wary of letting a Sumerian reading based on third millennium texts hide distinctions specific to the fourth millennium corpus, Englund makes major changes to the identification of signs, which have been followed in proto-cuneiform studies since:

1. Switching to a system of opaque sign names without interpretation, for instance, always GAR for the proposed U+127EF PROTO-CUNEIFORM SIGN GAR regardless of context rather than a context-dependent reading gar (heap), nin<sub>2</sub> (thing), or ninda (bread) and interchangeable GAR, NIJ<sub>2</sub>, or NINDA when referring to the abstract sign for U+120FB CUNEIFORM SIGN GAR.
2. Avoiding sign names based on Sumerian readings of sign sequences, so that is generally transliterated as a sequence, MUŠEN ŠE<sub>a</sub>, rather than UZ<sub>a</sub>.
3. Classifying allographs, for instance, KAŠ<sub>a</sub> through KAŠ<sub>d</sub> for variants of signs representing pots, whose cuneiform reflex is likely U+12049 CUNEIFORM SIGN BI (=KAŠ).

The classification of allographs can reveal semantic contrasts; for instance, the signs KAŠ<sub>a</sub> and KAŠ<sub>b</sub> appear to correspond to pots containing different substances, see [Eng98, p. 168], even though the linguistic distinction is unknown. In other cases, no semantic contrast can be identified, as between KAŠ<sub>b</sub> and KAŠ<sub>c</sub>. Effectively, from a character encoding standpoint, this approach to character identity is more akin to the one used for undeciphered scripts, and is contradictory to the model for a fully-deciphered script, where orthographic distinctions are encodable, but stylistic ones are not, even when they are somewhat systematic.

The avoidance of readings is also incompatible with a unified model, because it conflicts with the diachronic handling of mergers and splits. For signs that split in later phases of cuneiform, but have identical appearances in the early third millennium, such as MES and DUB, an interoperable encoding is obtained based on the reading: a sign read mes is encoded as U+12229, and a sign read dub is encoded as U+1207E. However, if the proto-cuneiform approach is followed and the sign is invariably transliterated as DUB, the resulting encoding may be incompatible with the one based on a Sumerian reading; see the example of the personal name mes-lu<sub>2</sub>-nu-še<sub>3</sub> in Section 4.1.

The same holds for the avoidance of readings of sign sequences; an interoperable encoding of cuneiform mes-lu<sub>2</sub>-nu-še<sub>3</sub> is incompatible with the one based on the reading mes-lu<sub>2</sub>-nu-še<sub>3</sub>.

is achieved by reading it as *nunuz uz<sup>mušen</sup>* “duck eggs”, and accordingly using the UZ sign, U+122BB 𒂔, whereas 𒂔𒂕 𒂔 is read as 𒂔 *sila<sub>3</sub>* še mušen niga “𒂔 *sila* of barley for fattening the birds”, and thus encoded using the sequence (U+122BA 𒂔, U+12137 𒂔). In general, this means that in the cuneiform script, interoperability is retained regardless of whether a particular *diri* (compound sign sequence) is encoded as a sequence, like 𒂔𒂔 or 𒂔𒂔, or atomically, like 𒂔 or 𒂔. In contrast, most transliterations of proto-cuneiform texts involving ducks transliterate them as a sequence, MUŠEN ŠE<sub>a</sub>. Even ignoring this inconsistency of encoding between fourth and third millennium texts in a putative unified encoding, a further problem would arise from the occasional transliteration that lets itself be influence by a Sumerian reading: a few transliterations, primarily those of composite lexical texts, use compound readings such as UZa. If these were encoded as cuneiform, the composites would then use the atomic signs, and would have an encoding inconsistent with their witnesses.

Finally, the opaque labels used as sign names, while initially based on an educated guess at the cuneiform reflex, need to be stable, and are therefore retained even when they prove to be incorrect as mappings to cuneiform signs; for instance, the proto-cuneiform sign 𒃗 ŠITA<sub>b3</sub> turns out not to be related to 𒃗 ŠITA, but instead to 𒃗 SILA<sub>x</sub>(LAK636) [Wag16, p. 220]; proto-cuneiform 𒃗 KAB is not the ancestor of cuneiform 𒃗 KAB, but instead that of 𒃗 HUB<sub>2</sub> and 𒃗 TUKU [Wag16, p. 274], a misnomer perhaps attributable to the second millennium 𒃗-𒃗 merger. The actual relation between proto-cuneiform and cuneiform signs is often more complex than a one-to-one mapping; see for instance [Wag16, p. 217] on the development of proto-cuneiform 𒃗 IM<sub>a</sub> and 𒃗 NI<sub>2</sub> into cuneiform 𒃗 TE, 𒃗 IM, and 𒃗 NI<sub>2</sub>, or [Wag16, p. 220] on the three proto-cuneiform ancestors of 𒃗 LAK636. In many cases, it is still poorly understood and may remain so.

These structural incompatibilities in the analysis of character identity, which stem from a now well-established approach to the fourth millennium texts ultimately motivated by the avoidance of assumptions about their language, therefore require a disunified approach.

## 4.1 ED I-II Excluded from the Proposal

It is generally recognized that there is a group of about 400 texts from the site of Ur which are later than Proto-Cuneiform but earlier than the ED IIIa corpus from Fara (Šuruppak): these are conventionally assigned to the Early Dynastic I-II period. There are also about two dozen tablets and fragments from Uruk that are assigned to the same period (Green; Lecompte nXXX).

Texts and signs from this period are excluded from the proto-cuneiform proposal.

In Englund's exhaustive discussion of the Archaic texts, he includes this period in his concluding remarks as the 8th phase of proto-cuneiform:

### 8. Period of late proto-cuneiform

Ca. 2800-2700 B.C. (Early Dynastic 1), this period is characterized by the earliest apparently multi-valent use of proto-cuneiform to write Sumerian words in personal names. The archaic numerical systems were used, but in simplified forms, and the lexical lists were copied and transmitted, but no new lists were added. Tablets were as a rule clumsily formed and inscribed. (Englund OBO 160/1 [1998], p.215).

Appearing about 15 years later, Lecompte and Verderame's edition of ED I-II fragments from Ur observed that there are key features of the writing system that depart from the earlier PC practices, and by analysis of both personal names and the contexts of the texts that they are written in Sumerian language:

We decided to follow in the transliteration the system that is commonly accepted for Sumerian, thus in small type and in accordance with the values of the signs available on the e-PSD website or in aBZL. We did not adopt the codes applied to the archaic texts from Uruk and Jemdet Nasr, although the transliteration available for lexical tablets in ATU 3 follows such a system for the ED I-II period. This choice is justified by the fact that the signs in the texts from Ur do not seem to present the same variants as their archaic forerunners: for example, the different shapes of E<sub>2</sub> cannot be classified into E<sub>2~a</sub>, E<sub>2~b...;</sub>; furthermore, some signs have no variant, such as DU<sub>8</sub>, which is always drawn according to a standard and well known shape. Second, as the language of these texts is undoubtedly Sumerian, it would have been unnecessary to use such values: instead of writing such cumbersome transliterations as DUB-a-LU<sub>2</sub>-NU-ŠE<sub>3</sub> or EN-a-GAN-a-GI4-a, it was accordingly more convenient to propose directly Mes-lu<sub>2</sub>-nu-še<sub>3</sub> and En-he<sub>2</sub>-gi<sub>4</sub>. (Lecompte and Verderame 2014, p.4)

Another factor which marks the ED I-II corpus as transitional between Uruk III/Jemdet Nasr and ED IIIa is the organization and structure of tablets. In a thorough survey of these "diplomatics", Lecompte, based on the work of the original editor of the ED I-II corpus from Ur, Burrows, summarizes the situation as follows:

As Burrows has already noted, archaic texts from Ur are intermediate in nature. Features common with Late Uruk/Jemdet Nasr tablets include:

- an oblong shape, half rounded sides, larger tablets having a rectangular format.
- a reverse generally left uninscribed.
- the presence of clauses and subscripts freely disposed apart from or into the columns.
- tablets from Ur displaying rows of lines inconsistent with the usual columns; this clearly comes from the horizontal lines subdivided into columns observable in a few of the Jemdet Nasr texts.

On the other hand, the ED I-II texts are forerunners to the ED III tablets in regard to the following aspects: – surface, with a rather flat obverse and convex reverse.

- a lack of subdivision of cases similar to the Late Uruk period.
- total expressed as  $gu_2-an-\check{se}_3$ .

Other features are very specific to the ED I-II period, such as the clumsy form of many tablets and the random disposition of columns. (Lecompte 2016: 142).

After discussion among the proposal authors and Robin Leroy, we have determined that it is preferable to establish the end of the Uruk III period as the cutoff for Unicode PC encoding, and to assign the ED I-II signary to Sumero-Akkadian Cuneiform.

#### 4.1.1 PC signs in ED I-II

For characters that occur only in Proto-Cuneiform and ED I-II, we do not propose to encode the character twice; instead, as with the Archaic Cuneiform Numbers, we propose to treat isolated PC signs in ED I-II texts as archaic holdovers. An assignment of Script\_Extensions=Pcun Xsux will be proposed for these signs in future documents as they are identified.

Signs which occur only in ED I-II texts will be evaluated for encoding in SAC in the future, as will signs that first occur in ED I-II and recur in later periods.

## 5 Materials for Encoding Proto-Cuneiform

This section of the proposal gives an overview of the Proto-Cuneiform (PC) corpus and character set. Based on existing scholarship and published resources, it also defines some principles for assessing whether a given character should be considered encodable in Unicode at the present time. Applying these principles to the complete Proto-Cuneiform character set, a proposed encodable repertoire is also provided.

The complete repertoire is called here the Proto-Cuneiform Sign List (PCSL). The encodable subset and the associated documentation are called PC25, for Proto-Cuneiform 2025.

The description and definition of PCSL and PC25 are intertwined, and we do not attempt to treat them in a separate, linear way. Rather, the PC corpus is taken as the foundation and criteria are established for the defining the subcorpus that should be fully represented in PC25. Signs that occur *only* outside of this subcorpus are not considered encodable, but most of the texts that fall outside of this subcorpus are in fact fully covered by PC25 because the unencoded characters affect relatively few texts.

The PC corpus as hosted on the Cuneiform Digital Library Initiative website is the most important resource for encoding PC because it defines current scholarly practice in the field. PCSL and PC25 diverge from this corpus systematically only in the translation of the corpus to the Unicode notations used by Oracc, the Open Richly Annotated Cuneiform Corpus. The PCSL corpus makes only minor adjustments to the CDLI corpus to correct for some minor notational inconsistencies.

Another major resource for encoding PC is the set of published sign lists as well as the collection of signs based on the work of Bob Englund that is available on the CDLI github repository. These lists are described and were systematically treated during the creation of PCSL. The individual alignments of sign lists with PCSL are not given

here but are available online. The individual sign lists are, however, integrated in the synoptic tabulation of PCSL given in Appendix C.

The principles as well as an explanatory section on Sequences provide the rationale for selecting characters that occur in the PC25 subcorpus for encoding.

In Appendices A and B are PC25 code charts and a listing of the character repertoire.

## 5.1 Texts

The PC text Corpus is defined by the CDLI corpus of Proto-Cuneiform texts of Uruk V, Uruk IV, and Uruk III date, as adapted for use by PCSL: we call this CDLI-tc; note that CDLI-tc is used here only in the PCSL version of the corpus. This version has some minor modifications to the transliteration and has been converted to use Unicode transliteration conventions rather than the CDLI ASCII ones.

There are 7224 texts in the corpus of which 105 are attributed to Uruk V; 1907 are attributed to Uruk IV and 5212 to the subsequent Uruk III period.

### 5.1.1 The Print Corpus

The principal modern publications of the Proto-Cuneiform corpus are:

**ATU2=ZATU** [GN87]: M.W. Green, Nissen, H. *Zeichenliste der Archaischen Texte aus Uruk*, ATU 2, Berlin 1987.

**ATU3=LLATU** [EN93]: R.K. Englund und Nissen, H., unter Mitarbeit von Peter Damerow, "Die Lexikalischen Listen der Archaischen Texte aus Uruk" (ATU 3), Berlin 1993.

**ATU5** [Eng94]: R.K. Englund, *Archaic Administrative Texts from Uruk: The Early Campaigns*, ATU 5, Berlin 1994.

**ATU6** [EN94]: R.K. Englund and Nissen, H., >*Archaische Verwaltungs- texte aus Uruk: Vorderasiatische Museum II*, ATU 6, Berlin 2005.

**ATU7** [EN01]: R.K. Englund and Nissen, H., *Archaische Verwaltungs- texte aus Uruk: Die Heidelberger Sammlung*, ATU 7, Berlin 2001.

**MSVO1** [EG91]: R.K. Englund and Grégoire, J.-P., *The Proto-Cuneiform Texts from Jemdet Nasr*, MSVO 1, Berlin 1991.

**MSVO3** [Dam]: R.K. Englund, *The Proto-Cuneiform Texts from the Erlenmeyer Collection*, MSVO 3, Berlin forthcoming.

**MSVO4** [EG91]: R.K. Englund, *Proto-Cuneiform Texts from Diverse Collections*, MSVO 4, Berlin 1996.

**CUSAS01** [Mon07]: S.F. Monaco, *The Cornell University Archaic Tablets* (CUSAS 1), Bethesda, MD, 2007.

**CUSAS21** [Mon14]: S.F. Monaco, *Archaic Bullae and Tablets in the Cornell University Collections* (CUSAS 21), Bethesda, MD, 2014.

**CUSAS31** [Mon16]: S.F. Monaco, *Archaic Cuneiform Tablets from Private Collections* (CUSAS 31), Bethesda, MD, 2016.

### 5.1.2 The Digital Corpus

The digital corpus includes the contents of all of the above major publications:

- Uruk lexical tablets from ATU3 (Uruk IV and Uruk III)
- Uruk administrative tablets from ATU5, ATU6, ATU7 (Uruk V, Uruk IV and Uruk III); these supersede ATU1
- Jemdet Nasr (Uruk III) tablets from MSVO1; these supersede Langdon, PI
- Tablets from various locations from MSVO4; this includes non-Uruk tablets which were included in ATU1
- Tablets in private collections from various locations in CUSAS1, CUSAS21, and CUSAS31; these post-date the ATU and MSVO volumes
- Tablets from the "Erlenmeyer Collection"; these were to be published in MSVO3 which has not yet appeared; many of them have been edited by Englund and others in various publications, however

### 5.1.3 PCSL Corpus

PCSL's version of CDLI-tc has the following composition divided by provenience, period, and published versus unpublished status:

	V/pub	V/unp	V/all	IV/pub	IV/unp	IV/all	III/pub	III/unp	III/all
Uruk	69	0	69	1373	486	1859	2764	1084	3848
JN	2	0	2	0	0	0	238	31	269
Umma	0	0	0	0	0	0	93	305	398
Uqair	0	0	0	0	0	0	42	0	42
Misc	23	11	34	36	12	48	587	68	655
total	94	11	105	1409	498	1907	3724	1488	5212

### 5.1.4 PC25 Corpus

About 1/3 of the PCSL corpus is available only in transliteration or photograph and has not yet been subjected to the rigorous assessment of a scholarly edition. These texts are removed to create a subcorpus of well-studied text to serve as the basis for the initial (and largest) phase of encoding of Proto-Cuneiform.

The subsetting is based on the CDLI catalogue entries as of February 2025. It is possible that features of the CDLI data may mean that a few texts that should have been omitted are included in the PC25 corpus and vice versa. The impact of this on the final repertoire is negligible, however, because of the cross-checking between corpus and published sign lists.

PC25's subset of the PCSL corpus has the following composition divided by provenience, period, and published/unpublished status:

	V/pub	V/unp	V/all	IV/pub	IV/unp	IV/all	III/pub	III/unp	III/all
Uruk	69	0	69	1350	0	1350	2720	0	2720
JN	2	0	2	0	0	0	238	0	238
Umma	0	0	0	0	0	0	93	0	93
Uqair	0	0	0	0	0	0	42	0	42
Misc	23	0	23	36	0	36	587	1	588
total	94	11	94	1386	498	1386	3680	1488	3681

## 5.2 Signs

### 5.2.1 Grapheme Distribution

A general impression of the amount of graphemic data in the various subcorpora is given in the table below. In each case, the numbers are the count of distinct signs and the total number of instances of signs, with numerical signs and ideograms being given in separate rows.

### 5.2.2 PCSL Corpus Grapheme Distribution

	V/pub	V/unp	V/all	IV/pub	IV/unp	IV/all	III/pub	III/unp	III/all
Uruk/num	23/152	0/0	23/152	163/5390	91/1536	180/6926	214/15031	106/2481	223/17512
Uruk/idg	19/24	0/0	19/24	874/6761	422/1646	981/8407	1347/25296	622/6210	1422/31506
JN/num	3/3	0/0	3/3	0/0	0/0	0/0	138/2530	0/0	138/2530
JN/idg	0/0	0/0	0/0	0/0	0/0	0/0	451/4243	0/0	451/4243
Umma/num	0/0	0/0	0/0	0/0	0/0	0/0	121/1595	137/3855	167/5450
Umma/idg	0/0	0/0	0/0	0/0	0/0	0/0	387/2305	575/7343	683/9648
Uqair/num	0/0	0/0	0/0	0/0	0/0	0/0	50/444	0/0	50/444
Uqair/idg	0/0	0/0	0/0	0/0	0/0	0/0	241/922	0/0	241/922
Misc/num	23/45	18/30	27/75	50/155	2/7	50/162	169/5229	56/749	169/5978
Misc/idg	1/1	1/2	2/3	54/88	21/26	68/114	689/8074	330/1470	776/9544
total	33/200	18/30	34/230	169/5545	91/1543	184/7088	262/24829	163/7085	275/31914
total	19/25	1/2	20/27	883/6849	426/1672	991/8521	1589/40840	915/15023	1775/55863

## 5.3 Lists

### 5.3.1 Historic Lists

The earliest list of Proto-Cuneiform signs is Stephen Langdon's PI [Lan28], a list accompanying the Jemdet Nasr tablets published in 1928. Less than ten years later, in 1936, Adam Falkenstein published the first list of signs from the archaic Uruk texts in ATU [Fal36]. Falkenstein referenced Langdon's list using the abbreviation PI.

### 5.3.2 The Intended Standard List

The Berlin Uruk projected intended ATU2 [GN87], more commonly known as ZATU, to be the new standard list. Published in 1987, the work lists many different sign forms for most signs, dividing them into Uruk IV and Uruk III, and alphabetizing the entries by the mnemonic sign names used within the project. Entries in ZATU make some use of a division into alloforms labeled, e.g., a and b as in the case of AB, but use of these divisions is sporadic and the examples are subsumed under their head signs.

However, by the time the list had been prepared, the project team had already begun to doubt that the groupings of variant sign-forms were an adequate reflection of likely semantic distinctions reflected by the sign-forms, as mentioned by Bob Englund in that volume ([GN87, 327f.]).

### 5.3.3 Revisionist Lists

Between 1991 and 1996, in a series of publications appearing subsequent to ZATU, Englund provided sign lists specific to the sub-corpora edited in the volumes which essentially replace all previous lists.

The four lists and their coverage are:

**LLATU** [EN93]: Lexical lists from Uruk, but with some extraneous signs or forms from ED duplicates, replacing ZATU's coverage of lexical lists

**ATU5** [Eng94]: Administrative texts from Uruk, replacing ATU1 signlist and ZATU

**MSVO1** [EG91]: Administative texts from Jemdet Nasr, replacing PI and ZATU

**MSVO4** [Eng96]: Administrative texts from various proveniences, replacing ZATU

The sign lists are based on exhaustive scholarly reassessments of individual portions of the PC corpus and make extensive use of the contrastive notations with subscript letters+numbers, e.g., ABa and ABb. At the same time, these lists gather non-contrastive sign variants under their respective parent signs and this is taken into account in PC25.

Englund's subsequent corpus-edition volumes ATU6 [EN94] and ATU7 [EN01], contain grapheme indices without images of the individual signs.

### 5.3.4 The Digital List

CDLI-gh is not 100% complete with respect to the PC corpus; includes some signs from ED duplicates of PC lexical texts; and includes a handful of signs which are either duplicates or are apparently place-holders from ongoing work on the Schøyen Umma texts that was never completed.

### 5.3.5 The Oracc List

The Oracc project [Tin24] provides a complete, corpus-based sign list comprising the CDLI texts from the Uruk V, Uruk IV, and Uruk III periods. PCSL was created in support of assessing previous proposals and eventually preparing the current proposal. It is based on CDLI-gh, and augments that collection with additional signs and glyphs from the published sign lists and the text corpus. PCSL gives distribution data for signs in the corpus, an overview of which signs occur in the other sign lists, and a proposed repertoire for encoding in Unicode. A succinct presentation of PCSL is included as Appendix A of the proposal.

### 5.3.6 Sign Lists and Prior PC Proposals

Prior PC proposals were centred on CDLI-gh, treating it as the definitive assemblage of PC signs at the same time as recognizing several important considerations:

The published sign list of Uruk Lexical Texts from ATU3 (LLATU) was also utilized as a partial control on CDLI-gh. However, three additional lists in a similar format to the LLATU lists were not used in prior proposals, leading to an inadequate understanding of previously published scholarship on the PC repertoire. Together with LLATU these three previously unutilized lists provide a comprehensive new presentation of the material covered in ZATU and need to be included as part of the foundational data of the PC proposal.

The four modern sign lists are an invaluable complement to CDLI-gh because they represent the carefully considered subset of signs which were vetted for publication whereas CDLI-gh is a working collection of signs. These sign lists make it clear that the unmarked variants in CDLI-gh are non-contrastive variants as opposed to the contrastive variants marked with subscript letter+number sequences.

### 5.3.7 Sign List Cautions

Sign lists have certain characteristics that can make them unsuitable for using to define a character repertoire:

- Sign lists offer one perspective on a repertoire; they are not necessarily exhaustive catalogues of every sign in a corpus.
- Sign lists often have entries that are convenient for descriptive purposes, or for users, but which do not constitute a 1:1 correspondence with the Unicode approach to characters.
  - Entries may contain several signs under one heading—this is done in CDLI-gh when the several members given are considered non-contrastive.
  - Entries may combine sequences of signs if the sequence is common or interesting.

Sometimes these sequences correspond to later cuneiform sign combinations which have known semantics in Sumero-Akkadian Cuneiform (SAC) despite the fact that there is no evidence that the PC sign shares those semantics or is even necessarily an antecedant of the SAC sign in anything but form and structure.

Signs are also sometimes grouped into sequences when there is a suspected semantic basis for the grouping, even though the grouping might be considered phrasal rather than being a concatenation of

components with specific semantics: examples include the combinations of N57 signs with ideograms where the notation may indicate the age of an animal or some other multiplicative relationship of the number and a commodity. Thus,  $|1(N57).AB_2|$  may mean "a one-year-old cow" and could equally well be notated as  $1(N57) AB_2$ —in fact, the corpus instances of such sequences often occur in both forms.

- Sign forms are abstractions; two-dimensional sketches of a three-dimensional writing system which tend to offer typical forms. This means that sign lists do not normally capture the full range of glyph-variation for any individual character; simply because a sign does not have unmarked variants in CDLI-gh doesn't mean such variants don't exist.
- Although most of character readings use sign names that recall SAC signs, Englund is clear that "until the language affinity of the archaic texts is established, these readings remain entirely conventional and often serve only mnemonic purposes, whereas the meaning of many signs is now quite clear" (ATU5 p.19).
- Importantly, Englund is explicit in the introduction that the reference forms of the signs ("graphemes" in Englund's terminology) are only exemplary forms:

After each sign name a grapheme is presented which represents the general form of the sign on the tablets cited. This graphic must be understood as merely an orientation in understanding the form a particular sign could take, since in particular the texts from the earliest stage of writing exhibit, to varying degrees, a tolerance of graphemic variation. (ATU5 p.107)

## 5.4 Coverage

Although the strategically selected subset of the Uruk IV/III corpus is only two-thirds of the entire corpus in terms of manuscripts, the graphemic coverage provided by the combination of ACN and PC25 is very high. Of the 7224 texts in the entire PCSL corpus, 157 contain unencoded signs, i.e., 97.62% of texts have no unencoded graphemes.

The total number of instances of graphemes that are included in the encoded repertoire is substantial: of 98055 instances of 2040 graphemes, only 240 instances of 171 graphemes are not encoded. 99.76% of instances of graphemes in PCSL are represented in the encodings either directly or as sequences.

## 6 Principles for Encoding

Each character that occurs in the PC25 subset of the PCSL corpus has been assessed according to the following principles in order to determine its encodability. Encoded signs are given in Appendix A and B; the condensed version of the Proto-Cuneiform Sign List, PCSL, is given Appendix C and contains essential information relating to the encodability of each sign. Appendix D lists all of the manuscripts that have unencoded signs and the signs which they are missing. Appendices E to K give tables of signs excluded from PC25 under one of the reasons for which they were excluded.

In addition to the comments above on the corpus, signiary, and sign lists, some additional issues influence the Principles.

### 6.1 (Non-)Contrastive Usage

Previous proposals treated the whole of CDLI-gh as a flat sample of sign forms and assigned codepoints to each form. All of the resources, however, are highly consistent in listing and transliterating some variant sign forms as non-contrastive and this practice is followed in PC25: the grouping of sign forms under a sign sign name and the practice of transliterating variant sign forms with a single transliteration are both indicators of non-contrastive glyphs.

The scholarly assessment of when sign forms are non-contrastive is based on several kinds of evidence. There is often a historical dimension where Uruk IV (earlier) and Uruk III (later) forms are presumptively of the same sign: Uruk IV forms tend to have more curves and more complex shapes. For many signs, this analysis is assisted by duplicate manuscripts of word lists ("lexical texts") that give the same text with variant sign forms. Elsewhere,

commodity lists of phrasal constructs can give contextual information on the likelihood that two distinct forms actually belong to the same sign.

Transliteration practices in the CDLI corpus closely mirror the contrastive/non-contrastive distinction. For example, the SAG sign has several different glyph forms but is always transliterated SAG. Conversely, KUŠU<sub>2</sub> is a base name that has six different allographs, KUŠU<sub>2</sub>-a to KUŠU<sub>2</sub>-f: each of these allographs has instances in the corpus.

### 6.1.1 (Non-)Contrastive Usage in Complex and Compound Signs

CDLI-tc and CDLI-gh do not always differentiate compound constituents to the same extent as the independent versions of the constituents. For example, KAR<sub>2</sub> is separated as KAR<sub>2</sub>-a and KAR<sub>2</sub>-b in CDLI-tc and CDLI-gh, but in the DARA<sub>3</sub>×KAR<sub>2</sub> compounds the only notations that occur are |DARA<sub>3</sub>-c×KAR<sub>2</sub>| and |DARA<sub>3</sub>-d×KAR<sub>2</sub>|. The encoding by default follows the CDLI notations in such cases.

## 6.2 Sequences

Sequences are a class of compound signs which exhibit a low degree of integration with each other. In later cuneiform they are written as a linear sequence in which the constituents and order may vary. In PC, they are written in linear form or as a cluster because PC accounts are laid out in various combinations of cases (or boxes). The identification of a group of signs as a discrete sequence can vary from one text editor to another, and from one sign list to another. As a result, sequences are a variable and open-ended category which are not suited to encoding as characters. If a sequence such as |MUŠEN.ŠE| were encoded as a character there would be two reasonable representations of the data: the character encoding, and the encoding as the sequence of constituents. The handling of sequences in PCSL—including a list of exceptions which are actually encoded—is described in a separate section later in this document.

## 6.3 Principles

The following principles were applied in the development of the PC25 proposal's repertoire:

1. Treat the PC corpus as the primary source of truth about the signiary and usage. Use the corpus as a control on the lists; use the published lists and corpus as a control on CDLI-gh.
2. Align names with CDLI-tc/CDLI-gh as much as possible to ensure that the encoding is closely aligned with existing scholarly practice. Make exceptions where required to correct names or to improve consistency of the naming scheme; if in doubt, retain the CDLI names.
3. Take contrastive usage into account to the extent supported by contemporary scholarship and do not encode non-contrastive sign variants under their own codepoints. The CDLI-tc corpus is the primary guide to non-contrastive usage: different sign forms which are transliterated the same are accepted as non-contrastive.
4. Accept that allograph notations in the corpus are contrastive
5. Do not introduce finer-grained allograph notations than CDLI-tc/CDLI-gh is using. The decisions made in the corpus about whether sign variants are contrastive or not are made not only on the basis of form but also context of various kinds; specialists in the corpus should decide if further division is needed in the future
6. Do not require a minimum number of occurrences for encoding: the corpus consists of mostly fragmentary manuscripts over 5000 years old—if a sign clearly exists and meets the other principles for encoding, it should be encoded
7. Do not assume that every sign list entry should be encoded as a character
8. Do not generally encode sequences; this includes sequences which are named in CDLI-gh and CDLI-tc as single characters ("opaque sequences") but where the naming is an interpretive mnemonic for a sign group such as ŠAB for |PA.IB| and the like

9. Do make exceptions to the sequences rule for items which:
  - are not historically sequences but are later decomposed, e.g., some city names
  - would require the encoding of separate constituent characters for a single case
  - form part of a group which contains a mixture of members where some members might otherwise be encoded as characters and others as sequence
10. Consider distribution of components when encoding complex (X×Y) versus compound (X.Y or Y.X); sometimes, especially for rare signs, it is not clear whether the juxtaposition of components is part of the sign structure or the distribution of individual elements on the manuscript. In such cases it is preferable to treat the signs as a sequence rather than a complex.
11. Do not separately encode signs which occur only in complex signs
12. Do not encode uncertain signs, especially those from unedited texts such as the Schoyen Umma material
13. Do not encode broken signs; include them in the PUA instead.

#### **6.4 Advantages of the Revised Approach**

There are several advantages to the revised approach to PC encoding:

- the encoding is better aligned with transliteration practice
- additional glyph variants can be added without impacting the encoding; encoding every glyph variant would open PC to arbitrary open-ended encoding of slight differences with little basis for distinguishing when a variant should be encoded and when not: adopting the position that scholarly annotation of glyph variance as contrastive is required for encoding would set reasonable boundaries on what can be encoded and what should not be
- new sequences can be added without impacting the encoding; this is especially important for the productive types involving N57 and time notations involving U<sub>4</sub>
- variant forms can be managed with font features rather than needing encoding
- the approach is generally more robust in regard to future discoveries as a result of the above points; where absolutely necessary unifications/disunifications could be considered if they are clearly demonstrable improvements to the utility of the encoding

#### **6.5 Reference Glyphs**

The introduction of 1:several relationships where an encoded character has multiple variants entails the need for a principled selection of reference glyphs.

In order to have some level of consistency it would be preferable to select either Uruk IV glyphs or Uruk III glyphs as the primary choice of reference glyphs. Because the corpus is predominantly Uruk III in date it makes sense to use Uruk III reference glyphs as far as possible.

PC25 reference glyphs are aligned where possible with Uruk III sign forms occurring in published texts originating from Uruk or Jemdet Nasr. The selection of the reference glyph is not necessarily an indication that the other sign forms in EASL do not occur in the same period or place. It means simply that the reference glyph has been confirmed to occur, where possible, in Uruk III Uruk/Jemdet Nasr.

For sequences with multiple forms, the reference form is always the simplest/closest to the sequence description, as long as that form occurs in the corpus. This means that by default the sign looks the way it is described, and ligatures, reorderings, or non-linear dispositions are always accessed by CVNN.

Note that the selection of a reference glyph does not imply that the form is normative—the corpus is restricted and sign form variation is considerable which means that even the concept of a normative form is inapplicable to many signs.

## 6.6 More on Sequences

### 6.6.1 Sequences are not encoded

Following the above principles, signs which are composed of sequences of multiple adjacent signs should not be encoded. The surface form of sequences can be variable in the ordering, selection, and disposition of components, all of which are treated as glyph variations and not as discrete characters.

In Proto-Cuneiform writing sequences are not necessarily linear: because the manuscripts are organized in cases (or boxes), signs are routinely juxtaposed in clusters in which the components can be written above, below, or near each other as well as being beside each other in a line.

### 6.6.2 Opaque sequences are not encoded

In standard transliteration practice for Proto-Cuneiform some signs are given simple names which do not reflect their status as a sequence, e.g., LUGAL is actually a sequence of GAL<sub>2</sub> and LU<sub>2</sub>, or LU<sub>2</sub> and GAL. We call these sequences "opaque sequences" and, like regular sequences, they are not encoded.

### 6.6.3 Reasons for Exceptions

Although sequences are not generally encoded, there are several reasons for making exceptions to this policy:

**Reanalysis** Proto-Cuneiform signs that are originally integral units may be reanalyzed into separate constituents. Where this is demonstrably the case, the original character is encoded and the reanalyzed sequence is considered a glyph variant.

**Container Equivalency** Some signs are allowed as exceptions because the juxtaposition of elements is the equivalent of a container (TIMES) relationship.

**Unencoded Constituents** Some sequences contain constituents that are otherwise unattested; in this case the choice is either to encode a sign which may not be attested independently, or to encode the sequence. In general the option adopted is to encode the sequence as a character.

**Analogy** Some sequences are part of a group and would naturally be considered by users of the encoding to be analogous to each other. Where one or more members of a group fulfils either of the previous conditions for encoding as a character, PC25 encodes the entire group as individual characters by analogy to avoid a possibly confusing mixture of encoded and unencoded group members.

### 6.6.4 List of Exceptions

**Reanalysis** Two city-name signs, ADAB and ARARMA~a, have earlier forms which are distinct from their reanalysis to include an initial U<sub>4</sub> component. Other city names may also have earlier integral forms but without further evidence they are not proposed for encoding as characters at this point.

**Container Equivalency** The signs ASAR and AZ are the equivalent of containers.

**Unencoded Constituents** The following exception signs contain unencoded constituents: ME<sub>3</sub> (EŠDA-tenu), ŠAGINA (modified UŠ form with additional strokes, unclear with this is an UŠ or not), ZUBI~a (NA<sub>2</sub>-nutillu).

**Analogy: BAPPIR Group** The group of signs with the base BAPPIR has one member which is a container (BAP-PIR~e) and the entire group is encoded by analogy.

**Analogy: Sheep Group** The groups of signs with the base SILANITA, UDUNITA and UTUA represent various types (ages, genders) of sheep and since some of them have unencoded constituents the members of all groups are encoded as characters.

**Analogy: UTUL Group** The UTUL group contains one member which includes an uncoded superposed reduplicated component (UTUL~c), so the entire group is encoded as characters.

## 7 Proposal Documents

The reference data for the proposal is in ‘UnicodeData.txt’, attached to this PDF.  
Code charts and a character list are provided in the following pages for informational purposes only.

## 7.1 Code Charts

	1269	126A	126B	126C	126D	126E	126F
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
A							
B							
C							
D							
E							
F							

	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	127A	127B	127C	127D	127E	127F
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	128A	128B	128C	128D	128E	128F
0																
12800																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	129A	129B	129C	129D	129E	129F
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

	12A0	12A1	12A2	12A3	12A4	12A5	12A6	12A7	12A8	12A9	12AA	12AB	12AC	12AD	12AE	12AF
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

	12B0	12B1	12B2	12B3	12B4	12B5	12B6	12B7	12B8	12B9	12BA	12BB	12BC	12BD	12BE	12BF
0	12B00	12B10	12B20	12B30	12B40	12B50	12B60	12B70	12B80	12B90	12BA0	12BB0	12BC0	12BD0	12BE0	12BF0
1	12B01	12B11	12B21	12B31	12B41	12B51	12B61	12B71	12B81	12B91	12BA1	12BB1	12BC1	12BD1	12BE1	12BF1
2	12B02	12B12	12B22	12B32	12B42	12B52	12B62	12B72	12B82	12B92	12BA2	12BB2	12BC2	12BD2	12BE2	12BF2
3	12B03	12B13	12B23	12B33	12B43	12B53	12B63	12B73	12B83	12B93	12BA3	12BB3	12BC3	12BD3	12BE3	12BF3
4	12B04	12B14	12B24	12B34	12B44	12B54	12B64	12B74	12B84	12B94	12BA4	12BB4	12BC4	12BD4	12BE4	12BF4
5	12B05	12B15	12B25	12B35	12B45	12B55	12B65	12B75	12B85	12B95	12BA5	12BB5	12BC5	12BD5	12BE5	12BF5
6	12B06	12B16	12B26	12B36	12B46	12B56	12B66	12B76	12B86	12B96	12BA6	12BB6	12BC6	12BD6	12BE6	12BF6
7	12B07	12B17	12B27	12B37	12B47	12B57	12B67	12B77	12B87	12B97	12BA7	12BB7	12BC7	12BD7	12BE7	12BF7
8	12B08	12B18	12B28	12B38	12B48	12B58	12B68	12B78	12B88	12B98	12BA8	12BB8	12BC8	12BD8	12BE8	12BF8
9	12B09	12B19	12B29	12B39	12B49	12B59	12B69	12B79	12B89	12B99	12BA9	12BB9	12BC9	12BD9	12BE9	12BF9
A	12B0A	12B1A	12B2A	12B3A	12B4A	12B5A	12B6A	12B7A	12B8A	12B9A	12BA	12BB	12BC	12BD	12BE	12FA
B	12B0B	12B1B	12B2B	12B3B	12B4B	12B5B	12B6B	12B7B	12B8B	12B9B	12BA	12BB	12BC	12BD	12BE	12FB
C	12B0C	12B1C	12B2C	12B3C	12B4C	12B5C	12B6C	12B7C	12B8C	12B9C	12BA	12BB	12BC	12BD	12EC	12FC
D	12B0D	12B1D	12B2D	12B3D	12B4D	12B5D	12B6D	12B7D	12B8D	12B9D	12BA	12BB	12BC	12BD	12ED	12FD
E	12B0E	12B1E	12B2E	12B3E	12B4E	12B5E	12B6E	12B7E	12B8E	12B9E	12BA	12BB	12BC	12BD	12ED	12FD
F	12B0F	12B1F	12B2F	12B3F	12B4F	12B5F	12B6F	12B7F	12B8F	12B9F	12BA	12BB	12BC	12BD	12ED	12FD

## 7.2 Character List

12690		PROTO-CUNEIFORM SIGN A	126C2		PROTO-CUNEIFORM SIGN AZ
12691		PROTO-CUNEIFORM SIGN A TIMES EN-A	126C3		PROTO-CUNEIFORM SIGN AZU
12692		PROTO-CUNEIFORM SIGN A TIMES SHUBUR	126C4		PROTO-CUNEIFORM SIGN BA
12693		PROTO-CUNEIFORM SIGN A TIMES ZATU672	126C5		PROTO-CUNEIFORM SIGN BAD
12694		PROTO-CUNEIFORM SIGN A TIMES ONE N14	126C6		PROTO-CUNEIFORM SIGN BAD OVER BAD
12695		PROTO-CUNEIFORM SIGN A2	126C7		PROTO-CUNEIFORM SIGN BAD3-A
12696		PROTO-CUNEIFORM SIGN AB-A	126C8		PROTO-CUNEIFORM SIGN BAD3-B1
12697		PROTO-CUNEIFORM SIGN AB-A TIMES A TENU	126C9		PROTO-CUNEIFORM SIGN BAD3-B2
12698		PROTO-CUNEIFORM SIGN AB-A TIMES ASH2	126CA		PROTO-CUNEIFORM SIGN BAHAR2-A
12699		PROTO-CUNEIFORM SIGN AB-A TIMES SHE-A OVER SHE-A	126CB		PROTO-CUNEIFORM SIGN BAHAR2-B
1269A		PROTO-CUNEIFORM SIGN AB-A TIMES ZATU659	126CC		PROTO-CUNEIFORM SIGN BAHAR2-C
1269B		PROTO-CUNEIFORM SIGN AB-A TIMES ONE N04	126CD		PROTO-CUNEIFORM SIGN BALA-A
1269C		PROTO-CUNEIFORM SIGN AB-A GUNU	126CE		PROTO-CUNEIFORM SIGN BALA-B
1269D		PROTO-CUNEIFORM SIGN AB-B	126CF		PROTO-CUNEIFORM SIGN BALAG
1269E		PROTO-CUNEIFORM SIGN AB2	126D0		PROTO-CUNEIFORM SIGN BAN-A
1269F		PROTO-CUNEIFORM SIGN AB2 TIMES TWO N14	126D1		PROTO-CUNEIFORM SIGN BAN-B
126A0		PROTO-CUNEIFORM SIGN ABZU	126D2		PROTO-CUNEIFORM SIGN BANSHUR-A
126A1		PROTO-CUNEIFORM SIGN AD-A	126D3		PROTO-CUNEIFORM SIGN BANSHUR-A TENU
126A2		PROTO-CUNEIFORM SIGN AD-B	126D4		PROTO-CUNEIFORM SIGN BANSHUR-B1
126A3		PROTO-CUNEIFORM SIGN AD-C	126D5		PROTO-CUNEIFORM SIGN BANSHUR-B2
126A4		PROTO-CUNEIFORM SIGN ADAB	126D6		PROTO-CUNEIFORM SIGN BANSHUR-C
126A5		PROTO-CUNEIFORM SIGN ADDA	126D7		PROTO-CUNEIFORM SIGN BAPPIR-A
126A6		PROTO-CUNEIFORM SIGN AGAR2	126D8		PROTO-CUNEIFORM SIGN BAPPIR-B
126A7		PROTO-CUNEIFORM SIGN AK-A	126D9		PROTO-CUNEIFORM SIGN BAPPIR-C
126A8		PROTO-CUNEIFORM SIGN AK-B	126DA		PROTO-CUNEIFORM SIGN BAPPIR-D
126A9		PROTO-CUNEIFORM SIGN AL	126DB		PROTO-CUNEIFORM SIGN BAPPIR-E
126AA		PROTO-CUNEIFORM SIGN ALAN-A	126DC		PROTO-CUNEIFORM SIGN BAPPIR-F
126AB		PROTO-CUNEIFORM SIGN ALAN-B	126DD		PROTO-CUNEIFORM SIGN BAR
126AC		PROTO-CUNEIFORM SIGN ALAN-C	126DE		PROTO-CUNEIFORM SIGN BARA2-A
126AD		PROTO-CUNEIFORM SIGN ALAN-E	126DF		PROTO-CUNEIFORM SIGN BARA2-B
126AE		PROTO-CUNEIFORM SIGN ALIM	126E0		PROTO-CUNEIFORM SIGN BARA3
126AF		PROTO-CUNEIFORM SIGN AM-A	126E1		PROTO-CUNEIFORM SIGN BIR-A
126B0		PROTO-CUNEIFORM SIGN AM-B	126E2		PROTO-CUNEIFORM SIGN BIR-B
126B1		PROTO-CUNEIFORM SIGN AMA-A	126E3		PROTO-CUNEIFORM SIGN BIR-C
126B2		PROTO-CUNEIFORM SIGN AMA-A TIMES E2-A	126E4		PROTO-CUNEIFORM SIGN BIR3-A
126B3		PROTO-CUNEIFORM SIGN AMA-B	126E5		PROTO-CUNEIFORM SIGN BIR3-B
126B4		PROTO-CUNEIFORM SIGN AMAR	126E6		PROTO-CUNEIFORM SIGN BIR3-C
126B5		PROTO-CUNEIFORM SIGN AMAR TIMES TAR-C	126E7		PROTO-CUNEIFORM SIGN BU-A
126B6		PROTO-CUNEIFORM SIGN AMAR OVER AMAR	126E8		PROTO-CUNEIFORM SIGN BU-A JOINING DU6-A
126B7		PROTO-CUNEIFORM SIGN AN	126E9		PROTO-CUNEIFORM SIGN BU-A JOINING KI
126B8		PROTO-CUNEIFORM SIGN ANSHE-A	126EA		PROTO-CUNEIFORM SIGN BU-A TIMES A
126B9		PROTO-CUNEIFORM SIGN ANSHE-B	126EB		PROTO-CUNEIFORM SIGN BU-A OVER BU-A NA2-A
126BA		PROTO-CUNEIFORM SIGN ANSHE-C	126EC		PROTO-CUNEIFORM SIGN BU-A CROSSING BU-A NA2-A NUTILLU
126BB		PROTO-CUNEIFORM SIGN ANSHE-E	126ED		PROTO-CUNEIFORM SIGN BU-B
126BC		PROTO-CUNEIFORM SIGN ANSHE-F	126EE		PROTO-CUNEIFORM SIGN BU3
126BD		PROTO-CUNEIFORM SIGN APIN-A	126EF		PROTO-CUNEIFORM SIGN BULUG
126BE		PROTO-CUNEIFORM SIGN APIN-B	126F0		PROTO-CUNEIFORM SIGN BULUG3
126BF		PROTO-CUNEIFORM SIGN APIN-C	126F1		PROTO-CUNEIFORM SIGN BUR-A
126C0		PROTO-CUNEIFORM SIGN ARARMA2-A	126F2		PROTO-CUNEIFORM SIGN BUR-B
126C1		PROTO-CUNEIFORM SIGN ASAR	126F3		PROTO-CUNEIFORM SIGN BUR-C
			126F4		PROTO-CUNEIFORM SIGN BUR-D
			126F5		PROTO-CUNEIFORM SIGN BUR2

126F6		PROTO-CUNEIFORM SIGN DA-A	12726		PROTO-CUNEIFORM SIGN DU8-A
126F7		PROTO-CUNEIFORM SIGN DA-B	12727		PROTO-CUNEIFORM SIGN DU8-B
126F8		PROTO-CUNEIFORM SIGN DA-C	12728		PROTO-CUNEIFORM SIGN DU8-C
126F9		PROTO-CUNEIFORM SIGN DA-D	12729		PROTO-CUNEIFORM SIGN DU8-C TIMES AB2
126FA		PROTO-CUNEIFORM SIGN DAH	1272A		PROTO-CUNEIFORM SIGN DU8-C TIMES AMAR
126FB		PROTO-CUNEIFORM SIGN DAM	1272B		PROTO-CUNEIFORM SIGN DU8-C TIMES HI
126FC		PROTO-CUNEIFORM SIGN DANNA	1272C		PROTO-CUNEIFORM SIGN DU8-C TIMES UDU-A
126FD		PROTO-CUNEIFORM SIGN DAR-A	1272D		PROTO-CUNEIFORM SIGN DU8-C GUNU
126FE		PROTO-CUNEIFORM SIGN DAR-A TIMES A	1272E		PROTO-CUNEIFORM SIGN DUB-A
126FF		PROTO-CUNEIFORM SIGN DAR-B	1272F		PROTO-CUNEIFORM SIGN DUB-B
12700		PROTO-CUNEIFORM SIGN DAR-C	12730		PROTO-CUNEIFORM SIGN DUB-C
12701		PROTO-CUNEIFORM SIGN DARA3-A	12731		PROTO-CUNEIFORM SIGN DUB-D
12702		PROTO-CUNEIFORM SIGN DARA3-B	12732		PROTO-CUNEIFORM SIGN DUB-E
12703		PROTO-CUNEIFORM SIGN DARA3-C	12733		PROTO-CUNEIFORM SIGN DUB-F
12704		PROTO-CUNEIFORM SIGN DARA3-C TIMES KAR2	12734		PROTO-CUNEIFORM SIGN DUB-H
12705		PROTO-CUNEIFORM SIGN DARA3-C TIMES KAR2 PLUS SHE-A	12735		PROTO-CUNEIFORM SIGN DUB NUTILLU-A TIMES ONE N58 FORM A
12706		PROTO-CUNEIFORM SIGN DARA3-D	12736		PROTO-CUNEIFORM SIGN DUB NUTILLU-A TIMES ONE N58 FORM B
12707		PROTO-CUNEIFORM SIGN DARA3-D TIMES KAR2 PLUS SHE-A	12737		PROTO-CUNEIFORM SIGN DUB NUTILLU-B TIMES ONE N58-A
12708		PROTO-CUNEIFORM SIGN DARA3-D TIMES KAR2-B	12738		PROTO-CUNEIFORM SIGN DUB2
12709		PROTO-CUNEIFORM SIGN DARA4-A1	1273A		PROTO-CUNEIFORM SIGN DUG-A TIMES KU6-A
1270A		PROTO-CUNEIFORM SIGN DARA4-A2	1273B		PROTO-CUNEIFORM SIGN DUG-A TIMES NAGA-A
1270B		PROTO-CUNEIFORM SIGN DARA4-A3	1273C		PROTO-CUNEIFORM SIGN DUG-A TIMES U2-A
1270C		PROTO-CUNEIFORM SIGN DARA4-B	1273D		PROTO-CUNEIFORM SIGN DUG-A TIMES U2-B
1270D		PROTO-CUNEIFORM SIGN DARA4-C	1273E		PROTO-CUNEIFORM SIGN DUG-A TIMES ONE N57
1270E		PROTO-CUNEIFORM SIGN DARA4-C1	1273F		PROTO-CUNEIFORM SIGN DUG-B
1270F		PROTO-CUNEIFORM SIGN DARA4-C2	12740		PROTO-CUNEIFORM SIGN DUG-B TIMES AB2
12710		PROTO-CUNEIFORM SIGN DARA4-C3	12741		PROTO-CUNEIFORM SIGN DUG-B TIMES ANSHE-B
12711		PROTO-CUNEIFORM SIGN DARA4-C4	12742		PROTO-CUNEIFORM SIGN DUG-B TIMES ANSHE-D
12712		PROTO-CUNEIFORM SIGN DARA4-C5	12743		PROTO-CUNEIFORM SIGN DUG-B TIMES BALA-A
12713		PROTO-CUNEIFORM SIGN DARA4-D	12744		PROTO-CUNEIFORM SIGN DUG-B TIMES BIR3-C
12714		PROTO-CUNEIFORM SIGN DI	12745		PROTO-CUNEIFORM SIGN DUG-B TIMES DIN
12715		PROTO-CUNEIFORM SIGN DI TENU	12746		PROTO-CUNEIFORM SIGN DUG-B TIMES DIN REVERSED
12716		PROTO-CUNEIFORM SIGN DIB	12747		PROTO-CUNEIFORM SIGN DUG-B TIMES GA-A
12717		PROTO-CUNEIFORM SIGN DILMUN	12748		PROTO-CUNEIFORM SIGN DUG-B TIMES GA-B
12718		PROTO-CUNEIFORM SIGN DIM-A	12749		PROTO-CUNEIFORM SIGN DUG-B TIMES GESHTU-A
12719		PROTO-CUNEIFORM SIGN DIM-B	1274A		PROTO-CUNEIFORM SIGN DUG-B TIMES GESHTU-B
1271A		PROTO-CUNEIFORM SIGN DIM-C	1274B		PROTO-CUNEIFORM SIGN DUG-B TIMES GI6
1271B		PROTO-CUNEIFORM SIGN DIN	1274C		PROTO-CUNEIFORM SIGN DUG-B TIMES GISH
1271C		PROTO-CUNEIFORM SIGN DIN TIMES ONE N58	1274D		PROTO-CUNEIFORM SIGN DUG-B TIMES HI
1271D		PROTO-CUNEIFORM SIGN DIN TENU	1274E		PROTO-CUNEIFORM SIGN DUG-B TIMES HI GUNU-A
1271E		PROTO-CUNEIFORM SIGN DU	1274F		PROTO-CUNEIFORM SIGN DUG-B TIMES KASKAL
1271F		PROTO-CUNEIFORM SIGN DU TIMES ONE N58 TENU	12750		PROTO-CUNEIFORM SIGN DUG-B TIMES KU6-A
12720		PROTO-CUNEIFORM SIGN DU GUNU	12751		PROTO-CUNEIFORM SIGN DUG-B TIMES KUR-A
12721		PROTO-CUNEIFORM SIGN DU6-A	12752		PROTO-CUNEIFORM SIGN DUG-B TIMES KUR-B
12722		PROTO-CUNEIFORM SIGN DU6-A TIMES ONE N58	12753		PROTO-CUNEIFORM SIGN DUG-B TIMES KUR GUNU-A
12723		PROTO-CUNEIFORM SIGN DU6-B			
12724		PROTO-CUNEIFORM SIGN DU6-C			
12725		PROTO-CUNEIFORM SIGN DU7			

12754		PROTO-CUNEIFORM SIGN DUG-B TIMES LAM-A	12780		PROTO-CUNEIFORM SIGN E2-A TIMES ONE N58
12755		PROTO-CUNEIFORM SIGN DUG-B TIMES MASH	12781		TENU
12756		PROTO-CUNEIFORM SIGN DUG-B TIMES NAGA-A	12782		PROTO-CUNEIFORM SIGN E2-B
12757		PROTO-CUNEIFORM SIGN DUG-B TIMES NAM2	12783		PROTO-CUNEIFORM SIGN E2-B TIMES ONE N58
12758		PROTO-CUNEIFORM SIGN DUG-B TIMES SA-A	12784		TENU
12759		PROTO-CUNEIFORM SIGN DUG-B TIMES SA-A PLUS GI	12785		PROTO-CUNEIFORM SIGN E2-C
1275A		PROTO-CUNEIFORM SIGN DUG-B TIMES SI4-A	12786		PROTO-CUNEIFORM SIGN E2-D
1275B		PROTO-CUNEIFORM SIGN DUG-B TIMES SIG2-A1	12787		PROTO-CUNEIFORM SIGN E3-B
1275C		PROTO-CUNEIFORM SIGN DUG-B TIMES SIG2-A2	12788		PROTO-CUNEIFORM SIGN EDIN
1275D		PROTO-CUNEIFORM SIGN DUG-B TIMES SIG7	12789		PROTO-CUNEIFORM SIGN EN-A
1275E		PROTO-CUNEIFORM SIGN DUG-B TIMES SUHUR	1278A		PROTO-CUNEIFORM SIGN EN-B
1275F		PROTO-CUNEIFORM SIGN DUG-B TIMES SHAH2-A	1278B		PROTO-CUNEIFORM SIGN EN-C
12760		PROTO-CUNEIFORM SIGN DUG-B TIMES SHE-A	1278C		PROTO-CUNEIFORM SIGN EN GUNU-A
12761		PROTO-CUNEIFORM SIGN DUG-B TIMES SHE-A PLUS NAM2	1278D		PROTO-CUNEIFORM SIGN EN GUNU-B
12762		PROTO-CUNEIFORM SIGN DUG-B TIMES TAK4-A	1278E		PROTO-CUNEIFORM SIGN EN2
12763		PROTO-CUNEIFORM SIGN DUG-B TIMES TAK4-A PLUS SA-A	1278F		PROTO-CUNEIFORM SIGN ERIM-A
12764		PROTO-CUNEIFORM SIGN DUG-B TIMES TAK4-A PLUS SAL	12790		PROTO-CUNEIFORM SIGN ERIM-B1
12765		PROTO-CUNEIFORM SIGN DUG-B TIMES TI	12791		PROTO-CUNEIFORM SIGN ERIM-B2
12766		PROTO-CUNEIFORM SIGN DUG-B TIMES U2-A	12792		PROTO-CUNEIFORM SIGN ERIN
12767		PROTO-CUNEIFORM SIGN DUG-B TIMES U2-B	12793		PROTO-CUNEIFORM SIGN ESHDA
12768		PROTO-CUNEIFORM SIGN DUG-B TIMES UDU-A TIMES TAR-B	12794		PROTO-CUNEIFORM SIGN ESHDA TIMES TAR-A
12769		PROTO-CUNEIFORM SIGN DUG-B TIMES UH3-A	12795		PROTO-CUNEIFORM SIGN ESHGAR
1276A		PROTO-CUNEIFORM SIGN DUG-B TIMES UH3-A TENU	12796		PROTO-CUNEIFORM SIGN EZEN-A
1276B		PROTO-CUNEIFORM SIGN DUG-B TIMES ZATU764	12797		PROTO-CUNEIFORM SIGN EZEN-A
1276C		PROTO-CUNEIFORM SIGN DUG-B TIMES ZATU779	12798		TI TIMES ONE N57 PLUS AN
1276D		PROTO-CUNEIFORM SIGN DUG-B TIMES ZATU780	12799		PROTO-CUNEIFORM SIGN KAB
1276E		PROTO-CUNEIFORM SIGN DUG-B TIMES ZATU781	1279A		PROTO-CUNEIFORM SIGN EZEN-A
1276F		PROTO-CUNEIFORM SIGN DUG-B TIMES ZATU789 PLUS SA-A	1279B		TI TIMES EZEN-A
12770		PROTO-CUNEIFORM SIGN DUG-B TIMES ONE N57	1279C		TI TIMES EZEN-A
12771		PROTO-CUNEIFORM SIGN DUG-B TIMES ONE N57 PLUS KU3-A	1279D		TI TIMES EZEN-A
12772		PROTO-CUNEIFORM SIGN DUG-B TIMES ONE N58	1279E		TI TIMES EZEN-A
12773		PROTO-CUNEIFORM SIGN DUG-B OVER DUG-B TIMES ONE N58	1279F		TI TIMES EZEN-A
12774		PROTO-CUNEIFORM SIGN DUG-C	127A0		TI TIMES EZEN-A
12775		PROTO-CUNEIFORM SIGN DUG-C TIMES ONE N57	127A1		TI TIMES EZEN-A
12776		PROTO-CUNEIFORM SIGN DUG-C TENU	127A2		TI TIMES EZEN-B
12777		PROTO-CUNEIFORM SIGN DUG-D	127A3		TI TIMES EZEN-B
12778		PROTO-CUNEIFORM SIGN DUGUD	127A4		TI TIMES EZEN-B
12779		PROTO-CUNEIFORM SIGN DUR-A	127A5		TI TIMES EZINU-A
1277A		PROTO-CUNEIFORM SIGN DUR-B	127A6		TI TIMES EZINU-B
1277B		PROTO-CUNEIFORM SIGN DUR2	127A7		TI TIMES EZINU-C
1277C		PROTO-CUNEIFORM SIGN E-A	127A8		TI TIMES EZINU-D
1277D		PROTO-CUNEIFORM SIGN E-B	127A9		TI TIMES EZINU-D
1277E		PROTO-CUNEIFORM SIGN E-C	127AA		TI TIMES GA-A
1277F		PROTO-CUNEIFORM SIGN E2-A	127AB		TI TIMES GA-B
			127AC		TI TIMES GA-C
			127AD		TI TIMES GA-C

127AE		PROTO-CUNEIFORM SIGN GA2-A1	127DD		PROTO-CUNEIFORM SIGN GADA-B GUNU
127AF		PROTO-CUNEIFORM SIGN GA2-A1 TIMES A	127DE		PROTO-CUNEIFORM SIGN GAL-A
127B0		PROTO-CUNEIFORM SIGN GA2-A1 TIMES E2-A	127DF		PROTO-CUNEIFORM SIGN GAL-B
127B1		PROTO-CUNEIFORM SIGN GA2-A1 TIMES EN-B	127E0		PROTO-CUNEIFORM SIGN GALGA-A
127B2		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GESHTU-A	127E1		PROTO-CUNEIFORM SIGN GAN-A
127B3		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GESHTU-C3	127E2		PROTO-CUNEIFORM SIGN GAN-B
127B4		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GESHTU-C5	127E3		PROTO-CUNEIFORM SIGN GAN-C
127B5		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GIR-A	127E4		PROTO-CUNEIFORM SIGN GAN-C TIMES DIN
127B6		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GIR-A PLUS KU6-A	127E5		PROTO-CUNEIFORM SIGN GAN-C TIMES HI
127B7		PROTO-CUNEIFORM SIGN GA2-A1 TIMES GISH	127E6		PROTO-CUNEIFORM SIGN GAN-C TIMES HI PLUS DIN
127B8		TENU	127E7		PROTO-CUNEIFORM SIGN GAN-C TIMES KASH-C
127B9		PROTO-CUNEIFORM SIGN GA2-A1 TIMES HI	127E8		PROTO-CUNEIFORM SIGN GAN-C TIMES KUR-A
127BA		PLUS KU6-A	127E9		PLUS A
127BB		PROTO-CUNEIFORM SIGN GA2-A1 TIMES KU6-A JOINING KU6-A	127EA		PROTO-CUNEIFORM SIGN GAN-C TIMES LAGAB-B
127BC		PROTO-CUNEIFORM SIGN GA2-A1 TIMES KU6-A	127EB		PROTO-CUNEIFORM SIGN GAN-C TIMES SIG7
127BD		PROTO-CUNEIFORM SIGN GA2-A1 TIMES LAGAB-B	127EC		PROTO-CUNEIFORM SIGN GAN-C TIMES ZATU777
127BE		PROTO-CUNEIFORM SIGN GA2-A1 TIMES MASH	127ED		PROTO-CUNEIFORM SIGN GAN-C TIMES FOUR N57 PLUS GAR
127BF		PROTO-CUNEIFORM SIGN GA2-A1 TIMES PAD-B	127EE		PROTO-CUNEIFORM SIGN GAN-D TIMES GESHTU-A
127C0		PROTO-CUNEIFORM SIGN GA2-A1 TIMES PAP-A	127EF		PROTO-CUNEIFORM SIGN GAN2
127C1		PROTO-CUNEIFORM SIGN GA2-A1 TIMES SU-A	127F0		PROTO-CUNEIFORM SIGN GAR
127C2		PROTO-CUNEIFORM SIGN GA2-A1 TIMES SUHUR	127F1		PROTO-CUNEIFORM SIGN GUNU-A
127C3		PROTO-CUNEIFORM SIGN GA2-A1 TIMES SUKUD	127F2		PROTO-CUNEIFORM SIGN GAR GUNU-B
127C4		PROTO-CUNEIFORM SIGN GA2-A1 TIMES SUMASH	127F3		PROTO-CUNEIFORM SIGN GAR GUNU-C
127C5		PROTO-CUNEIFORM SIGN GA2-A1 TIMES SHA	127F4		PROTO-CUNEIFORM SIGN GAR3
127C6		PROTO-CUNEIFORM SIGN GA2-A1 TIMES TI	127F5		PROTO-CUNEIFORM SIGN GARA2-A
127C7		PROTO-CUNEIFORM SIGN GA2-A1 TIMES U4	127F6		PROTO-CUNEIFORM SIGN GAZI
127C8		PROTO-CUNEIFORM SIGN GA2-A1 TIMES ONE N14	127F7		PROTO-CUNEIFORM SIGN GESHTIN-A
127C9		PROTO-CUNEIFORM SIGN GA2-A1 TIMES ONE N57	127F8		PROTO-CUNEIFORM SIGN GESHTIN-D
127CA		PROTO-CUNEIFORM SIGN GA2-A2	127F9		PROTO-CUNEIFORM SIGN GESHTIN-E
127CB		PROTO-CUNEIFORM SIGN GA2-A2 TIMES GU4	127FA		PROTO-CUNEIFORM SIGN GESHTU-A TIMES SHE-A TENU
127CC		PROTO-CUNEIFORM SIGN GA2-A2 TIMES NI-A	127FB		PROTO-CUNEIFORM SIGN GESHTU-B
127CD		PROTO-CUNEIFORM SIGN GA2-A2 TIMES SUHUR	127FC		PROTO-CUNEIFORM SIGN GESHTU-C3
127CE		PROTO-CUNEIFORM SIGN GA2-A2 TIMES SHE3	127FD		PROTO-CUNEIFORM SIGN GESHTU-C5
127CF		PROTO-CUNEIFORM SIGN GA2-A2 TIMES SHE3 PLUS GU4	127FE		PROTO-CUNEIFORM SIGN GI
127D0		PROTO-CUNEIFORM SIGN GA2-A3	127FF		PROTO-CUNEIFORM SIGN GI
127D1		PROTO-CUNEIFORM SIGN GA2-A4	12800		PROTO-CUNEIFORM SIGN GI TIMES A
127D2		PROTO-CUNEIFORM SIGN GA2-B	12801		PROTO-CUNEIFORM SIGN GI TIMES GISH TENU
127D3		PROTO-CUNEIFORM SIGN GA2-B TIMES DUB-A	12802		PROTO-CUNEIFORM SIGN GI TIMES KU-B1
127D4		PROTO-CUNEIFORM SIGN GA2-B TIMES DUB-B	12803		PROTO-CUNEIFORM SIGN GI TIMES LAGAB-A
127D5		PROTO-CUNEIFORM SIGN GA2-B TIMES KU6-A	12804		PROTO-CUNEIFORM SIGN GI TIMES NAM2
127D6		PROTO-CUNEIFORM SIGN GA2-B TIMES ZATU659	12805		PROTO-CUNEIFORM SIGN GI TIMES SIG2-D1
127D7		PROTO-CUNEIFORM SIGN GA2-C	12806		PROTO-CUNEIFORM SIGN GI TIMES SHE3
127D8		PROTO-CUNEIFORM SIGN GAAR-A1	12807		PROTO-CUNEIFORM SIGN GI TIMES ONE N14
127D9		PROTO-CUNEIFORM SIGN GAAR-A2	12808		PROTO-CUNEIFORM SIGN GI TIMES ONE N58 TENU
127DA		PROTO-CUNEIFORM SIGN GAAR-B1	12809		PROTO-CUNEIFORM SIGN GI OVER GI
127DB		PROTO-CUNEIFORM SIGN GAAR-B2	1280A		PROTO-CUNEIFORM SIGN GI OVER GI TIMES GISH TENU
127DC		PROTO-CUNEIFORM SIGN GADA-A	1280B		PROTO-CUNEIFORM SIGN GI OVER GI OVER GI

1280C		PROTO-CUNEIFORM SIGN GI4-A	1283A		PROTO-CUNEIFORM SIGN GUG2
1280D		PROTO-CUNEIFORM SIGN GI4-A TIMES A	1283B		PROTO-CUNEIFORM SIGN GUG2 TIMES SILA3-A
1280E		PROTO-CUNEIFORM SIGN GI4-B	1283C		PROTO-CUNEIFORM SIGN GUG2 TIMES TUR
1280F		PROTO-CUNEIFORM SIGN GI4-B OVER GI4-B	1283D		PROTO-CUNEIFORM SIGN GUUKKAL-A
12810		PROTO-CUNEIFORM SIGN GI6	1283E		PROTO-CUNEIFORM SIGN GUUKKAL-B
12811		PROTO-CUNEIFORM SIGN GIBIL	1283F		PROTO-CUNEIFORM SIGN GUUKKAL-C
12812		PROTO-CUNEIFORM SIGN GIR-A	12840		PROTO-CUNEIFORM SIGN GUUKKAL-D
12813		PROTO-CUNEIFORM SIGN GIR-B	12841		PROTO-CUNEIFORM SIGN GUL
12814		PROTO-CUNEIFORM SIGN GIR-C	12842		PROTO-CUNEIFORM SIGN GUM-A
12815		PROTO-CUNEIFORM SIGN GIR2-A	12843		PROTO-CUNEIFORM SIGN GUM-B
12816		PROTO-CUNEIFORM SIGN GIR3-A	12844		PROTO-CUNEIFORM SIGN GUM-B NUTILLU
12817		PROTO-CUNEIFORM SIGN GIR3-A TIMES SHE-B	12845		PROTO-CUNEIFORM SIGN GUN3-A
12818		PROTO-CUNEIFORM SIGN GIR3-B	12846		PROTO-CUNEIFORM SIGN GUN3-B
12819		PROTO-CUNEIFORM SIGN GIR3-C	12847		PROTO-CUNEIFORM SIGN GUR
1281A		PROTO-CUNEIFORM SIGN GIR3-C TIMES SHE3	12848		PROTO-CUNEIFORM SIGN GURUSH-A
1281B		PROTO-CUNEIFORM SIGN GIR3 GUNU-A	12849		PROTO-CUNEIFORM SIGN GURUSH-A TIMES TWO N14
1281C		PROTO-CUNEIFORM SIGN GIR3 GUNU-B	1284A		PROTO-CUNEIFORM SIGN GURUSH-B
1281D		PROTO-CUNEIFORM SIGN GIR3 GUNU-C	1284B		PROTO-CUNEIFORM SIGN GURUSH-B TIMES TWO N14
1281E		PROTO-CUNEIFORM SIGN GISAL-A	1284C		PROTO-CUNEIFORM SIGN GURUSH-C TIMES TWO
1281F		PROTO-CUNEIFORM SIGN GISAL-B	1284D		PROTO-CUNEIFORM SIGN GURUSHDA
12820		PROTO-CUNEIFORM SIGN GISH	1284E		PROTO-CUNEIFORM SIGN HAL
12821		PROTO-CUNEIFORM SIGN GISH TIMES DIN PLUS DIN FORM A	1284F		PROTO-CUNEIFORM SIGN HALUB
12822		PROTO-CUNEIFORM SIGN GISH TIMES DIN PLUS DIN FORM B	12850		PROTO-CUNEIFORM SIGN HASHHUR
12823		PROTO-CUNEIFORM SIGN GISH TIMES DIN PLUS DIN FORM C	12851		PROTO-CUNEIFORM SIGN HASHHUR TIMES MA
12824		PROTO-CUNEIFORM SIGN GISH TIMES SHU2	12852		PROTO-CUNEIFORM SIGN HI
12825		PROTO-CUNEIFORM SIGN GISH TIMES SHU2 FORM A	12853		PROTO-CUNEIFORM SIGN HI TIMES ONE N57
12826		PROTO-CUNEIFORM SIGN GISH TENU	12854		PROTO-CUNEIFORM SIGN HI TENU
12827		PROTO-CUNEIFORM SIGN GISH3-A	12855		PROTO-CUNEIFORM SIGN HI GUNU-A
12828		PROTO-CUNEIFORM SIGN GISH3-A OVER GISH3-A	12856		PROTO-CUNEIFORM SIGN HI GUNU-B
12829		PROTO-CUNEIFORM SIGN GISH3-B	12857		PROTO-CUNEIFORM SIGN HI GUNU-C
1282A		PROTO-CUNEIFORM SIGN GISHGAL	12858		PROTO-CUNEIFORM SIGN I
1282B		PROTO-CUNEIFORM SIGN GISHIMMAR-A1	12859		PROTO-CUNEIFORM SIGN IB-A
1282C		PROTO-CUNEIFORM SIGN GISHIMMAR-A2	1285A		PROTO-CUNEIFORM SIGN IB-A NUTILLU
1282D		PROTO-CUNEIFORM SIGN GISHIMMAR-A3	1285B		PROTO-CUNEIFORM SIGN IB-B
1282E		PROTO-CUNEIFORM SIGN GISHIMMAR-B1	1285C		PROTO-CUNEIFORM SIGN IB-C
1282F		PROTO-CUNEIFORM SIGN GISHIMMAR-B2	1285D		PROTO-CUNEIFORM SIGN IDIGNA
12830		PROTO-CUNEIFORM SIGN GISHIMMAR-B3	1285E		PROTO-CUNEIFORM SIGN IG-A
12831		PROTO-CUNEIFORM SIGN GU	1285F		PROTO-CUNEIFORM SIGN IG-B
12832		PROTO-CUNEIFORM SIGN GU2	12860		PROTO-CUNEIFORM SIGN IL
12833		PROTO-CUNEIFORM SIGN GU4	12861		PROTO-CUNEIFORM SIGN IM-A
12834		PROTO-CUNEIFORM SIGN GU4 GUNU	12862		PROTO-CUNEIFORM SIGN IM-B
12835		PROTO-CUNEIFORM SIGN GU7	12863		PROTO-CUNEIFORM SIGN IN-B
12836		PROTO-CUNEIFORM SIGN GUB3-A	12864		PROTO-CUNEIFORM SIGN IN-D
12837		PROTO-CUNEIFORM SIGN GUB3-B	12865		PROTO-CUNEIFORM SIGN IR-A
12838		PROTO-CUNEIFORM SIGN GUB3-C	12866		PROTO-CUNEIFORM SIGN IR-B
12839		PROTO-CUNEIFORM SIGN GUB3-D	12867		PROTO-CUNEIFORM SIGN IR-C
			12868		PROTO-CUNEIFORM SIGN IR-D
			12869		PROTO-CUNEIFORM SIGN ISH-A

1286A		PROTO-CUNEIFORM SIGN ISH-B	1289C		PROTO-CUNEIFORM SIGN KISAL-B2
1286B		PROTO-CUNEIFORM SIGN ISH-C	1289D		PROTO-CUNEIFORM SIGN KISAL-B2 TENU
1286C		PROTO-CUNEIFORM SIGN KA-A	1289E		PROTO-CUNEIFORM SIGN KISAL-B3
1286D		PROTO-CUNEIFORM SIGN KA-A TIMES SAR-A	1289F		PROTO-CUNEIFORM SIGN KISIM-A
1286E		PROTO-CUNEIFORM SIGN KA2-A	128A0		PROTO-CUNEIFORM SIGN KISIM-B
1286F		PROTO-CUNEIFORM SIGN KA2-B	128A1		PROTO-CUNEIFORM SIGN KISIM-C
12870		PROTO-CUNEIFORM SIGN KA2-D TIMES LAM-B	128A2		PROTO-CUNEIFORM SIGN KISH
12871		PROTO-CUNEIFORM SIGN KAB	128A3		PROTO-CUNEIFORM SIGN KISHIK-A
12872		PROTO-CUNEIFORM SIGN KAD4-A	128A4		PROTO-CUNEIFORM SIGN KISHIK-B
12873		PROTO-CUNEIFORM SIGN KAD4-B	128A5		PROTO-CUNEIFORM SIGN KITI
12874		PROTO-CUNEIFORM SIGN KAK-A	128A6		PROTO-CUNEIFORM SIGN KU-A
12875		PROTO-CUNEIFORM SIGN KAK-B	128A7		PROTO-CUNEIFORM SIGN KU-B1
12876		PROTO-CUNEIFORM SIGN KAL-A	128A8		PROTO-CUNEIFORM SIGN KU-B2
12877		PROTO-CUNEIFORM SIGN KAL-B1	128A9		PROTO-CUNEIFORM SIGN KU3-A
12878		PROTO-CUNEIFORM SIGN KAL-B2	128AA		PROTO-CUNEIFORM SIGN KU3-C
12879		PROTO-CUNEIFORM SIGN KALAM-A	128AB		PROTO-CUNEIFORM SIGN KU6-A
1287A		PROTO-CUNEIFORM SIGN KALAM-B	128AC		PROTO-CUNEIFORM SIGN KU6-A JOINING KU6-A
1287B		PROTO-CUNEIFORM SIGN KALAM-C	128AD		PROTO-CUNEIFORM SIGN KU6-C
1287C		PROTO-CUNEIFORM SIGN KALAM-D	128AE		PROTO-CUNEIFORM SIGN KU6-D
1287D		PROTO-CUNEIFORM SIGN KALAM-E	128AF		PROTO-CUNEIFORM SIGN KUR-A
1287E		PROTO-CUNEIFORM SIGN KALAM-F	128B0		PROTO-CUNEIFORM SIGN KUR-B
1287F		PROTO-CUNEIFORM SIGN KALAM-G	128B1		PROTO-CUNEIFORM SIGN KUR-C
12880		PROTO-CUNEIFORM SIGN KALAM-H	128B2		PROTO-CUNEIFORM SIGN KUR GUNU-A
12881		PROTO-CUNEIFORM SIGN KALAM-H2	128B3		PROTO-CUNEIFORM SIGN KUR GUNU-B
12882		PROTO-CUNEIFORM SIGN KAR2-A	128B4		PROTO-CUNEIFORM SIGN KUSHU2-A
12883		PROTO-CUNEIFORM SIGN KAR2-B	128B5		PROTO-CUNEIFORM SIGN KUSHU2-B
12884		PROTO-CUNEIFORM SIGN KASKAL	128B6		PROTO-CUNEIFORM SIGN KUSHU2-C
12885		PROTO-CUNEIFORM SIGN KASH-A	128B7		PROTO-CUNEIFORM SIGN KUSHU2-D
12886		PROTO-CUNEIFORM SIGN KASH-B	128B8		PROTO-CUNEIFORM SIGN KUSHU2-E
12887		PROTO-CUNEIFORM SIGN KASH-B TIMES SHE-A	128B9		PROTO-CUNEIFORM SIGN KUSHU2-F
	TENU		128BA		PROTO-CUNEIFORM SIGN LA-B
12888		PROTO-CUNEIFORM SIGN KASH-C	128BB		PROTO-CUNEIFORM SIGN LA-D
12889		PROTO-CUNEIFORM SIGN KASH-D	128BC		PROTO-CUNEIFORM SIGN LA2
1288A		PROTO-CUNEIFORM SIGN KI	128BD		PROTO-CUNEIFORM SIGN LAGAB-A
1288B		PROTO-CUNEIFORM SIGN KI NUTILLU	128BE		PROTO-CUNEIFORM SIGN LAGAB-A TIMES DU6-A
1288C		PROTO-CUNEIFORM SIGN KI NUTILLU TIMES DUB-A	128BF		PROTO-CUNEIFORM SIGN LAGAB-A TIMES KU6-A
1288D		PROTO-CUNEIFORM SIGN KIB	128C0		PROTO-CUNEIFORM SIGN LAGAB-A TIMES KU6-A JOINING KU6-A
1288E		PROTO-CUNEIFORM SIGN KIB GUNU	128C1		PROTO-CUNEIFORM SIGN LAGAB-A TIMES KUSHU2-A TENU
1288F		PROTO-CUNEIFORM SIGN KID-A	128C2		PROTO-CUNEIFORM SIGN LAGAB-A TIMES ME-A
12890		PROTO-CUNEIFORM SIGN KID-B	128C3		PROTO-CUNEIFORM SIGN LAGAB-A TIMES NUN-B
12891		PROTO-CUNEIFORM SIGN KID-C	128C4		PROTO-CUNEIFORM SIGN LAGAB-A TIMES PA-A
12892		PROTO-CUNEIFORM SIGN KID-D	128C5		PROTO-CUNEIFORM SIGN LAGAB-A TIMES SIG7
12893		PROTO-CUNEIFORM SIGN KID-E	128C6		PROTO-CUNEIFORM SIGN LAGAB-A TIMES SU-A
12894		PROTO-CUNEIFORM SIGN KIN	128C7		PROTO-CUNEIFORM SIGN LAGAB-A TIMES SHA
12895		PROTO-CUNEIFORM SIGN KIN2-A	128C8		PROTO-CUNEIFORM SIGN LAGAB-A TIMES SHITA-A1
12896		PROTO-CUNEIFORM SIGN KIN2-B	128C9		PROTO-CUNEIFORM SIGN LAGAB-A TIMES TI
12897		PROTO-CUNEIFORM SIGN KIN2-C	128CA		PROTO-CUNEIFORM SIGN LAGAB-A TIMES U4
12898		PROTO-CUNEIFORM SIGN KIN2-D			
12899		PROTO-CUNEIFORM SIGN KIN2-E			
1289A		PROTO-CUNEIFORM SIGN KISAL-A1			
1289B		PROTO-CUNEIFORM SIGN KISAL-B1			

128CB		PROTO-CUNEIFORM SIGN LAGAB-A TIMES UB	128F9		PROTO-CUNEIFORM SIGN MAH-A TIMES UTUA-A
128CC		PROTO-CUNEIFORM SIGN LAGAB-A TIMES ZATU753	128FA		PROTO-CUNEIFORM SIGN MAH-A TIMES ZATU659
128CD		PROTO-CUNEIFORM SIGN LAGAB-A TIMES TWO N14	128FB		PROTO-CUNEIFORM SIGN MAH-B TIMES NA-A
128CE		PROTO-CUNEIFORM SIGN LAGAB-A TIMES ONE N58	128FD		PROTO-CUNEIFORM SIGN MAH-B TIMES SAL
128CF		PROTO-CUNEIFORM SIGN LAGAB-B	128FE		PROTO-CUNEIFORM SIGN MAR-A
128D0		PROTO-CUNEIFORM SIGN LAGAB-B TIMES HI	128FF		PROTO-CUNEIFORM SIGN MAR-A GUNU
128D1		PROTO-CUNEIFORM SIGN LAGAB-B TIMES KUR-E	12900		PROTO-CUNEIFORM SIGN MAR-A TENU
128D2		PROTO-CUNEIFORM SIGN LAGAB-B TIMES PA-A	12901		PROTO-CUNEIFORM SIGN MAR-B
128D3		PROTO-CUNEIFORM SIGN LAGAB-B TIMES U4	12902		PROTO-CUNEIFORM SIGN MAR-B TIMES GAR
128D4		PROTO-CUNEIFORM SIGN LAGAB-B OVER LAGAB-B	12903		PROTO-CUNEIFORM SIGN MAR-B TIMES LAGAB-B PLUS SHE3
128D5		PROTO-CUNEIFORM SIGN LAGAR-A	12904		PROTO-CUNEIFORM SIGN MAR-B TIMES SHE-A
128D6		PROTO-CUNEIFORM SIGN LAGAR-A REVERSED	12905		PROTO-CUNEIFORM SIGN MASH
128D7		PROTO-CUNEIFORM SIGN LAGAR-B1	12906		PROTO-CUNEIFORM SIGN MASH2
128D8		PROTO-CUNEIFORM SIGN LAGAR-B2	12907		PROTO-CUNEIFORM SIGN MASH2 GUNU
128D9		PROTO-CUNEIFORM SIGN LAGAR-C	12908		PROTO-CUNEIFORM SIGN ME-A
128DA		PROTO-CUNEIFORM SIGN LAL2-A	12909		PROTO-CUNEIFORM SIGN ME-B
128DB		PROTO-CUNEIFORM SIGN LAL2-A TIMES NAGA-A	1290A		PROTO-CUNEIFORM SIGN ME3
128DC		PROTO-CUNEIFORM SIGN LAL2-A TIMES NIM-B2	1290B		PROTO-CUNEIFORM SIGN MEN-A
128DD		PROTO-CUNEIFORM SIGN LAL2-B	1290C		PROTO-CUNEIFORM SIGN MEN-B
128DE		PROTO-CUNEIFORM SIGN LAL3-A	1290D		PROTO-CUNEIFORM SIGN MES
128DF		PROTO-CUNEIFORM SIGN LAL3-B	1290E		PROTO-CUNEIFORM SIGN MIR-A
128E0		PROTO-CUNEIFORM SIGN LAM-A	1290F		PROTO-CUNEIFORM SIGN MIR-B
128E1		PROTO-CUNEIFORM SIGN LAM-B	12910		PROTO-CUNEIFORM SIGN MU
128E2		PROTO-CUNEIFORM SIGN LAM-B REVERSED	12911		PROTO-CUNEIFORM SIGN MUD
128E3		PROTO-CUNEIFORM SIGN LAM-B TENU	12912		PROTO-CUNEIFORM SIGN MUD3-A
128E4		PROTO-CUNEIFORM SIGN LISH	12913		PROTO-CUNEIFORM SIGN MUD3-A GUNU
128E5		PROTO-CUNEIFORM SIGN LU2	12914		PROTO-CUNEIFORM SIGN MUD3-B
128E6		PROTO-CUNEIFORM SIGN LUM	12915		PROTO-CUNEIFORM SIGN MUD3-C
128E7		PROTO-CUNEIFORM SIGN MA	12916		PROTO-CUNEIFORM SIGN MUD3-D
128E8		PROTO-CUNEIFORM SIGN MA TIMES A	12917		PROTO-CUNEIFORM SIGN MUL
128E9		PROTO-CUNEIFORM SIGN MA TIMES MA	12918		PROTO-CUNEIFORM SIGN MUN-A1
128EA		PROTO-CUNEIFORM SIGN MA TIMES ONE N58	12919		PROTO-CUNEIFORM SIGN MUN-A2
128EB		PROTO-CUNEIFORM SIGN MA2	1291A		PROTO-CUNEIFORM SIGN MUN-A3
128EC		PROTO-CUNEIFORM SIGN MAGUR-A	1291B		PROTO-CUNEIFORM SIGN MUN-A4
128ED		PROTO-CUNEIFORM SIGN MAH-A	1291C		PROTO-CUNEIFORM SIGN MUN-B
128EE		PROTO-CUNEIFORM SIGN MAH-A TIMES AB2	1291D		PROTO-CUNEIFORM SIGN MUNSHUB-A
128EF		PROTO-CUNEIFORM SIGN MAH-A TIMES GUKKAL-A	1291E		PROTO-CUNEIFORM SIGN MUNSHUB-B
128F0		PROTO-CUNEIFORM SIGN MAH-A TIMES KU6-A	1291F		PROTO-CUNEIFORM SIGN MUNU3
128F1		PROTO-CUNEIFORM SIGN MAH-A TIMES MASH	12920		PROTO-CUNEIFORM SIGN MUSH
128F2		PROTO-CUNEIFORM SIGN MAH-A TIMES NA-A	12921		PROTO-CUNEIFORM SIGN MUSH3-A
128F3		PROTO-CUNEIFORM SIGN MAH-A TIMES SILA3-A TIMES UMBIN-A	12922		PROTO-CUNEIFORM SIGN MUSH3-A GUNU
128F4		PROTO-CUNEIFORM SIGN MAH-A TIMES TUG2-A	12923		PROTO-CUNEIFORM SIGN MUSH3-B
128F5		PROTO-CUNEIFORM SIGN MAH-A TIMES TUN3-C	12924		PROTO-CUNEIFORM SIGN MUSHEN
128F6		PROTO-CUNEIFORM SIGN MAH-A TIMES UD5-A	12925		PROTO-CUNEIFORM SIGN ONE N58 BAD
128F7		PROTO-CUNEIFORM SIGN MAH-A TIMES UDU-A	12926		PROTO-CUNEIFORM SIGN ONE N58 PLUS BAD FORM B
128F8		PROTO-CUNEIFORM SIGN MAH-A TIMES UR-A	12927		PROTO-CUNEIFORM SIGN THREE N58 UR3-B1
			12928		PROTO-CUNEIFORM SIGN NA-A
			12929		PROTO-CUNEIFORM SIGN NA-B
			1292A		PROTO-CUNEIFORM SIGN NA-C
			1292B		PROTO-CUNEIFORM SIGN NA2-A

1292C		PROTO-CUNEIFORM SIGN NA2-B1	1295C		PROTO-CUNEIFORM SIGN NINDA2 TIMES HI PLUS AN PLUS ME-A
1292D		PROTO-CUNEIFORM SIGN NA2-B2	1295D		PROTO-CUNEIFORM SIGN NINDA2 TIMES ME-A
1292E		PROTO-CUNEIFORM SIGN NA2-C	1295E		PROTO-CUNEIFORM SIGN NINDA2 TIMES KASH-B
1292F		PROTO-CUNEIFORM SIGN NAB	1295F		PROTO-CUNEIFORM SIGN NINDA2 TIMES MAR-A
12930		PROTO-CUNEIFORM SIGN NAGA-A	12960		PROTO-CUNEIFORM SIGN NINDA2 TIMES MAR-B
12931		PROTO-CUNEIFORM SIGN NAGA-A TIMES TAK4-A	12961		PROTO-CUNEIFORM SIGN NINDA2 TIMES NUN-A
12932		PROTO-CUNEIFORM SIGN NAGA-B	12962		PROTO-CUNEIFORM SIGN NINDA2 TIMES U4
12933		PROTO-CUNEIFORM SIGN NAGAR-A	12963		PROTO-CUNEIFORM SIGN NINDA2 TIMES ZATU659 TIMES ONE N01
12934		PROTO-CUNEIFORM SIGN NAGAR-B	12964		PROTO-CUNEIFORM SIGN NINDA2 TIMES ZATU710
12935		PROTO-CUNEIFORM SIGN NAM-A	12965		PROTO-CUNEIFORM SIGN NINDA2 TIMES ONE N01
12936		PROTO-CUNEIFORM SIGN NAM-B	12966		PROTO-CUNEIFORM SIGN NINDA2 TIMES TWO N01
12937		PROTO-CUNEIFORM SIGN NAM-C	12967		PROTO-CUNEIFORM SIGN NINDA2 TIMES ONE N06 PLUS HI GUNU-A
12938		PROTO-CUNEIFORM SIGN NAM-D	12968		PROTO-CUNEIFORM SIGN NINDA2 TIMES ONE N08
12939		PROTO-CUNEIFORM SIGN NAM2	12969		PROTO-CUNEIFORM SIGN NIR-A
1293A		PROTO-CUNEIFORM SIGN NAM2 TIMES ONE N01	1296A		PROTO-CUNEIFORM SIGN NIR-A TIMES AN
1293B		PROTO-CUNEIFORM SIGN NAM2 GUNU	1296B		PROTO-CUNEIFORM SIGN NIR-B
1293C		PROTO-CUNEIFORM SIGN NAM2 TENU	1296C		PROTO-CUNEIFORM SIGN NU
1293D		PROTO-CUNEIFORM SIGN NANSHE-A	1296D		PROTO-CUNEIFORM SIGN NU GUNU
1293E		PROTO-CUNEIFORM SIGN NANSHE-B	1296E		PROTO-CUNEIFORM SIGN NU11
1293F		PROTO-CUNEIFORM SIGN NAR	1296F		PROTO-CUNEIFORM SIGN NU11 OVER NU11
12940		PROTO-CUNEIFORM SIGN NE-A	12970		PROTO-CUNEIFORM SIGN NU11 TENU
12941		PROTO-CUNEIFORM SIGN NE-B	12971		PROTO-CUNEIFORM SIGN NUMUN
12942		PROTO-CUNEIFORM SIGN NE-C	12972		PROTO-CUNEIFORM SIGN NUN-A
12943		PROTO-CUNEIFORM SIGN NE-D	12973		PROTO-CUNEIFORM SIGN NUN-A JOINING A
12944		PROTO-CUNEIFORM SIGN NESAG2-A	12974		PROTO-CUNEIFORM SIGN NUN-A JOINING EN-A
12945		PROTO-CUNEIFORM SIGN NESAG2-B	12975		PROTO-CUNEIFORM SIGN NUN-A JOINING EN-B
12946		PROTO-CUNEIFORM SIGN NI-A	12976		PROTO-CUNEIFORM SIGN NUN-A JOINING EN-D
12947		PROTO-CUNEIFORM SIGN NI-A GUNU	12977		PROTO-CUNEIFORM SIGN NUN-A JOINING NAM2
12948		PROTO-CUNEIFORM SIGN NI-B	12978		PROTO-CUNEIFORM SIGN NUN-B
12949		PROTO-CUNEIFORM SIGN NI-B TIMES FOUR N57	12979		PROTO-CUNEIFORM SIGN NUN-B JOINING EN-A
1294A		PROTO-CUNEIFORM SIGN NI-B TIMES EIGHT N57	1297A		PROTO-CUNEIFORM SIGN NUN-C
1294B		PROTO-CUNEIFORM SIGN NI2	1297B		PROTO-CUNEIFORM SIGN NUN-D
1294C		PROTO-CUNEIFORM SIGN NIGIN	1297C		PROTO-CUNEIFORM SIGN NUNUZ-A0
1294D		PROTO-CUNEIFORM SIGN NIM-A	1297D		PROTO-CUNEIFORM SIGN NUNUZ-A1
1294E		PROTO-CUNEIFORM SIGN NIM-B1	1297E		PROTO-CUNEIFORM SIGN NUNUZ-A2
1294F		PROTO-CUNEIFORM SIGN NIM-B2	1297F		PROTO-CUNEIFORM SIGN NUNUZ-B1
12950		PROTO-CUNEIFORM SIGN NIM-B3	12980		PROTO-CUNEIFORM SIGN NUNUZ-C
12951		PROTO-CUNEIFORM SIGN NIMGIR	12981		PROTO-CUNEIFORM SIGN PA-A
12952		PROTO-CUNEIFORM SIGN NINDA2	12982		PROTO-CUNEIFORM SIGN PA-B
12953		PROTO-CUNEIFORM SIGN NINDA2 TIMES AN	12983		PROTO-CUNEIFORM SIGN PAD-A
12954		PROTO-CUNEIFORM SIGN NINDA2 TIMES AN PLUS HI	12984		PROTO-CUNEIFORM SIGN PAD-B
12955		PROTO-CUNEIFORM SIGN NINDA2 TIMES AN PLUS ME-A	12985		PROTO-CUNEIFORM SIGN PAP-A
12956		PROTO-CUNEIFORM SIGN NINDA2 TIMES EZEN-B	12986		PROTO-CUNEIFORM SIGN PAP-A TENU
12957		PROTO-CUNEIFORM SIGN NINDA2 TIMES GAAR-A1	12987		PROTO-CUNEIFORM SIGN PAP-B
12958		PROTO-CUNEIFORM SIGN NINDA2 TIMES GAR	12988		PROTO-CUNEIFORM SIGN PIRIG-A1
12959		PROTO-CUNEIFORM SIGN NINDA2 TIMES GISH	12989		PROTO-CUNEIFORM SIGN PIRIG-A2
1295A		PROTO-CUNEIFORM SIGN NINDA2 TIMES GU4			
1295B		PROTO-CUNEIFORM SIGN NINDA2 TIMES HI			

1298A		PROTO-CUNEIFORM SIGN PIRIG-A3	129BA		PROTO-CUNEIFORM SIGN SIG
1298B		PROTO-CUNEIFORM SIGN PIRIG-B1	129BB		PROTO-CUNEIFORM SIGN SIG2-A1
1298C		PROTO-CUNEIFORM SIGN PIRIG-B1 JOINING DIN	129BC		PROTO-CUNEIFORM SIGN SIG2-A2
1298D		PROTO-CUNEIFORM SIGN PIRIG-B2	129BD		PROTO-CUNEIFORM SIGN SIG2-A3
1298E		PROTO-CUNEIFORM SIGN PU2	129BE		PROTO-CUNEIFORM SIGN SIG2-A4
1298F		PROTO-CUNEIFORM SIGN RA	129BF		PROTO-CUNEIFORM SIGN SIG2-B
12990		PROTO-CUNEIFORM SIGN RAD-A	129C0		PROTO-CUNEIFORM SIGN SIG2-B OVER SIG2-B
12991		PROTO-CUNEIFORM SIGN RAD-A GUNU	129C1		PROTO-CUNEIFORM SIGN SIG2-C1
12992		PROTO-CUNEIFORM SIGN RAD-B	129C2		PROTO-CUNEIFORM SIGN SIG2-C2
12993		PROTO-CUNEIFORM SIGN RI8-A	129C3		PROTO-CUNEIFORM SIGN SIG2-D1
12994		PROTO-CUNEIFORM SIGN RI8-B	129C4		PROTO-CUNEIFORM SIGN SIG2-D2
12995		PROTO-CUNEIFORM SIGN RU	129C5		PROTO-CUNEIFORM SIGN SIG2-D3
12996		PROTO-CUNEIFORM SIGN SA-A	129C6		PROTO-CUNEIFORM SIGN SIG2-D4
12997		PROTO-CUNEIFORM SIGN SA-C	129C7		PROTO-CUNEIFORM SIGN SIG2-E
12998		PROTO-CUNEIFORM SIGN SAG	129C8		PROTO-CUNEIFORM SIGN SIG4
12999		PROTO-CUNEIFORM SIGN SAG JOINING UKKIN-B	129CA		PROTO-CUNEIFORM SIGN SILA3-A
	TIMES ONE N57		129CB		PROTO-CUNEIFORM SIGN SILA3-A TIMES A
1299A		PROTO-CUNEIFORM SIGN SAG TIMES GESHTU-A	129CC		PROTO-CUNEIFORM SIGN SILA3-A TIMES AMAR
1299B		PROTO-CUNEIFORM SIGN SAG TIMES GESHTU-B	129CD		PROTO-CUNEIFORM SIGN SILA3-A TIMES DUG-A
1299C		PROTO-CUNEIFORM SIGN SAG TIMES MA	129CE		PROTO-CUNEIFORM SIGN SILA3-A TIMES GA-A
1299D		PROTO-CUNEIFORM SIGN SAG TIMES NAM2	129CF		PROTO-CUNEIFORM SIGN SILA3-A TIMES
1299E		PROTO-CUNEIFORM SIGN SAG GUNU	129D0		GARA2-A
1299F		PROTO-CUNEIFORM SIGN SAG NUTILU	129D1		PROTO-CUNEIFORM SIGN SILA3-A TIMES GESHTU-C3
129A0		PROTO-CUNEIFORM SIGN SAGSHU	129D2		PROTO-CUNEIFORM SIGN SILA3-A TIMES HASHHUR
129A1		PROTO-CUNEIFORM SIGN SAL	129D3		PROTO-CUNEIFORM SIGN SILA3-A TIMES HI
129A2		PROTO-CUNEIFORM SIGN SAL TIMES ONE N58	129D4		PROTO-CUNEIFORM SIGN SILA3-A TIMES IB-A
129A3		PROTO-CUNEIFORM SIGN SANGA-A	129D5		PROTO-CUNEIFORM SIGN SILA3-A TIMES KASH-A
129A4		PROTO-CUNEIFORM SIGN SANGA-B	129D6		PROTO-CUNEIFORM SIGN SILA3-A TIMES KASH-C
129A5		PROTO-CUNEIFORM SIGN SANGA-C	129D7		PROTO-CUNEIFORM SIGN SILA3-A TIMES KASH-D
129A6		PROTO-CUNEIFORM SIGN SANGA-E	129D8		PROTO-CUNEIFORM SIGN SILA3-A TIMES KU6-A
129A7		PROTO-CUNEIFORM SIGN SAR-A	129D9		PROTO-CUNEIFORM SIGN SILA3-A TIMES KUR-A
129A8		PROTO-CUNEIFORM SIGN SAR-A TIMES SHE-A	129DA		PROTO-CUNEIFORM SIGN SILA3-A TIMES MA
129A9		PROTO-CUNEIFORM SIGN SAR-B	129DB		PROTO-CUNEIFORM SIGN SILA3-A TIMES MASH
129AA		PROTO-CUNEIFORM SIGN SAR-C	129DC		PROTO-CUNEIFORM SIGN SILA3-A TIMES MUD3-B
129AB		PROTO-CUNEIFORM SIGN SAR-D	129DD		PROTO-CUNEIFORM SIGN SILA3-A TIMES NAGA-A
129AC		PROTO-CUNEIFORM SIGN SI	129DE		PROTO-CUNEIFORM SIGN SILA3-A TIMES NI-A
129AD		PROTO-CUNEIFORM SIGN SI JOINING AN	129DF		PROTO-CUNEIFORM SIGN SILA3-A TIMES NUN-B
129AE		PROTO-CUNEIFORM SIGN SI TIMES EN-A	129E0		PROTO-CUNEIFORM SIGN SILA3-A TIMES SUHUR
129AF		PROTO-CUNEIFORM SIGN SI TIMES GU4	129E1		PROTO-CUNEIFORM SIGN SILA3-A TIMES SUM-A
129B0		PROTO-CUNEIFORM SIGN SI TIMES KU-B1	129E2		PROTO-CUNEIFORM SIGN SILA3-A TIMES SUM-B
129B1		PROTO-CUNEIFORM SIGN SI TIMES SAL	129E3		PROTO-CUNEIFORM SIGN SILA3-A TIMES SHE-A
129B2		PROTO-CUNEIFORM SIGN SI TIMES SHE3	129E4		PROTO-CUNEIFORM SIGN SILA3-A TIMES SHE-A TENU
129B3		PROTO-CUNEIFORM SIGN SI TIMES TUN3-A	129E5		PROTO-CUNEIFORM SIGN SILA3-A TIMES SHU
129B4		PROTO-CUNEIFORM SIGN SI TIMES ONE N58	129E6		PROTO-CUNEIFORM SIGN SILA3-A TIMES SHU2
129B5		PROTO-CUNEIFORM SIGN SI4-A	129E7		PROTO-CUNEIFORM SIGN SILA3-A TIMES ZATU629
129B6		PROTO-CUNEIFORM SIGN SI4-B	129E8		PROTO-CUNEIFORM SIGN SILA3-A TIMES ZATU646
129B7		PROTO-CUNEIFORM SIGN SI4-C			
129B8		PROTO-CUNEIFORM SIGN SI4-D			
129B9		PROTO-CUNEIFORM SIGN SI4-F			

129E9	PROTO-CUNEIFORM SIGN SILA3-A TIMES ZATU659 PLUS TU-C	12A17	PROTO-CUNEIFORM SIGN SHA3-C
129EA	PROTO-CUNEIFORM SIGN SILA3-A TIMES ONE N57	12A18	PROTO-CUNEIFORM SIGN SHA3-D
129EB	PROTO-CUNEIFORM SIGN SILA3-B	12A19	PROTO-CUNEIFORM SIGN SHAGAN
129EC	PROTO-CUNEIFORM SIGN SILA3-B TIMES GUG2	12A1A	PROTO-CUNEIFORM SIGN SHAGINA
129ED	PROTO-CUNEIFORM SIGN SILA3-B TIMES NAGA-B	12A1B	PROTO-CUNEIFORM SIGN SHAH2-A
129EE	PROTO-CUNEIFORM SIGN SILA3-B TIMES NI-A	12A1C	PROTO-CUNEIFORM SIGN SHAH2-B
129EF	PROTO-CUNEIFORM SIGN SILA3-B TIMES NI-B	12A1D	PROTO-CUNEIFORM SIGN SHAH2-C
129F0	PROTO-CUNEIFORM SIGN SILA3-C TIMES ZATU687	12A1E	PROTO-CUNEIFORM SIGN SHAKIR-A
129F1	PROTO-CUNEIFORM SIGN SILA4-A	12A1F	PROTO-CUNEIFORM SIGN SHAKIR-B
129F2	PROTO-CUNEIFORM SIGN SILA4-B	12A20	PROTO-CUNEIFORM SIGN SHAKIR-C
129F3	PROTO-CUNEIFORM SIGN SILA4-C	12A21	PROTO-CUNEIFORM SIGN SHAM2
129F4	PROTO-CUNEIFORM SIGN SILA4-D	12A22	PROTO-CUNEIFORM SIGN SHE-A
129F5	PROTO-CUNEIFORM SIGN SILANITA	12A23	PROTO-CUNEIFORM SIGN SHE-A OVER SHE-A
129F6	PROTO-CUNEIFORM SIGN SIMUG	12A24	PROTO-CUNEIFORM SIGN SHE-A TENU
129F7	PROTO-CUNEIFORM SIGN SU-A	12A25	PROTO-CUNEIFORM SIGN SHE-B
129F8	PROTO-CUNEIFORM SIGN SU-A TIMES ONE N58	12A26	PROTO-CUNEIFORM SIGN SHE-C
129F9	PROTO-CUNEIFORM SIGN SU-B	12A27	PROTO-CUNEIFORM SIGN SHE3
129FA	PROTO-CUNEIFORM SIGN SU-C	12A28	PROTO-CUNEIFORM SIGN SHE3 TENU
129FB	PROTO-CUNEIFORM SIGN SU3	12A29	PROTO-CUNEIFORM SIGN SHEG9
129FC	PROTO-CUNEIFORM SIGN SUG	12A2A	PROTO-CUNEIFORM SIGN SHEN-A
129FD	PROTO-CUNEIFORM SIGN SUG5	12A2B	PROTO-CUNEIFORM SIGN SHEN-B
129FE	PROTO-CUNEIFORM SIGN SUH3	12A2C	PROTO-CUNEIFORM SIGN SHEN-C
129FF	PROTO-CUNEIFORM SIGN SUHUR	12A2D	PROTO-CUNEIFORM SIGN SHEN-C TENU
12A00	PROTO-CUNEIFORM SIGN SUHUR GUNU	12A2E	PROTO-CUNEIFORM SIGN SHEN-D TIMES A
12A01	PROTO-CUNEIFORM SIGN SUHUR NUTILLU	12A2F	PROTO-CUNEIFORM SIGN SHEN-E
12A02	PROTO-CUNEIFORM SIGN SUHUR TENU	12A30	PROTO-CUNEIFORM SIGN SHENNUR-A
12A03	PROTO-CUNEIFORM SIGN SUKKAL	12A31	PROTO-CUNEIFORM SIGN SHENNUR-B
12A04	PROTO-CUNEIFORM SIGN SUKUD	12A32	PROTO-CUNEIFORM SIGN SHESH-A
12A05	PROTO-CUNEIFORM SIGN SUKUD JOINING SUKUD FORM A	12A33	PROTO-CUNEIFORM SIGN SHESH-B
12A06	PROTO-CUNEIFORM SIGN SUKUD JOINING SUKUD FORM B	12A34	PROTO-CUNEIFORM SIGN SHIDIM
12A07	PROTO-CUNEIFORM SIGN SUKUD GUNU-A	12A35	PROTO-CUNEIFORM SIGN SHIM-A
12A08	PROTO-CUNEIFORM SIGN SUKUD GUNU-B	12A36	PROTO-CUNEIFORM SIGN SHIM-B
12A09	PROTO-CUNEIFORM SIGN SUKUD GUNU-C	12A37	PROTO-CUNEIFORM SIGN SHIR-A
12A0A	PROTO-CUNEIFORM SIGN SUKUD GUNU-D	12A38	PROTO-CUNEIFORM SIGN SHIR-B
12A0B	PROTO-CUNEIFORM SIGN SUM-A	12A39	PROTO-CUNEIFORM SIGN SHITA-A1
12A0C	PROTO-CUNEIFORM SIGN SUM-B	12A3A	PROTO-CUNEIFORM SIGN SHITA-A1 TIMES KAK-A
12A0D	PROTO-CUNEIFORM SIGN SUMASH	12A3B	PROTO-CUNEIFORM SIGN SHITA-A1 TIMES SHU
12A0E	PROTO-CUNEIFORM SIGN SUR	12A3C	PROTO-CUNEIFORM SIGN SHITA-A2
12A0F	PROTO-CUNEIFORM SIGN SHA	12A3D	PROTO-CUNEIFORM SIGN SHITA-A3
12A10	PROTO-CUNEIFORM SIGN SHA TIMES HI GUNU-A FORM A	12A3E	PROTO-CUNEIFORM SIGN SHITA-B1
12A11	PROTO-CUNEIFORM SIGN SHA TIMES HI GUNU-A FORM B	12A3F	PROTO-CUNEIFORM SIGN SHITA-B2
12A12	PROTO-CUNEIFORM SIGN SHA GUNU	12A40	PROTO-CUNEIFORM SIGN SHITA-B2 GUNU TIMES HI GUNU-A
12A13	PROTO-CUNEIFORM SIGN SHA3-A1	12A41	PROTO-CUNEIFORM SIGN SHITA-B3
12A14	PROTO-CUNEIFORM SIGN SHA3-A2	12A42	PROTO-CUNEIFORM SIGN SHITA-B3 TIMES NAM2
12A15	PROTO-CUNEIFORM SIGN SHA3-A2 GUNU	12A43	PROTO-CUNEIFORM SIGN SHITA GUNU-A
12A16	PROTO-CUNEIFORM SIGN SHA3-B	12A44	PROTO-CUNEIFORM SIGN SHITA GUNU-A TIMES ONE N06
		12A45	PROTO-CUNEIFORM SIGN SHITA GUNU-B
		12A46	PROTO-CUNEIFORM SIGN SHU
		12A47	PROTO-CUNEIFORM SIGN SHU TIMES ONE N58
		12A48	PROTO-CUNEIFORM SIGN SHU OVER SHU

12A49		PROTO-CUNEIFORM SIGN SHU GUNU	12A7C		PROTO-CUNEIFORM SIGN U2-A
12A4A		PROTO-CUNEIFORM SIGN SHU2	12A7D		PROTO-CUNEIFORM SIGN U2-B
12A4B		PROTO-CUNEIFORM SIGN SHU12	12A7E		PROTO-CUNEIFORM SIGN U2-C
12A4C		PROTO-CUNEIFORM SIGN SHUBUR	12A7F		PROTO-CUNEIFORM SIGN U4
12A4D		PROTO-CUNEIFORM SIGN SHUM	12A80		PROTO-CUNEIFORM SIGN U4 TIMES ONE N58
12A4E		PROTO-CUNEIFORM SIGN SHUR2 TIMES ONE N58	12A81		PROTO-CUNEIFORM SIGN U4 TIMES ONE N01
12A4F		PROTO-CUNEIFORM SIGN SHUR2-A	12A82		PLUS ONE N24
12A50		PROTO-CUNEIFORM SIGN SHUR2-B	12A83		PROTO-CUNEIFORM SIGN U4 TIMES THREE N01
12A51		PROTO-CUNEIFORM SIGN TA-A	12A84		PROTO-CUNEIFORM SIGN U4 TIMES FOUR N01
12A52		PROTO-CUNEIFORM SIGN TA-B	12A85		PROTO-CUNEIFORM SIGN U4 TIMES FIVE N01
12A53		PROTO-CUNEIFORM SIGN TA-C	12A86		PROTO-CUNEIFORM SIGN U4 TIMES SIX N01
12A54		PROTO-CUNEIFORM SIGN TA-D	12A87		PROTO-CUNEIFORM SIGN U4 TIMES EIGHT N01
12A55		PROTO-CUNEIFORM SIGN TA-E	12A88		PROTO-CUNEIFORM SIGN U4 TIMES ONE N14
12A56		PROTO-CUNEIFORM SIGN TAG-A1	12A89		PLUS ONE N01
12A57		PROTO-CUNEIFORM SIGN TAG-A1 TENU	12A8A		PROTO-CUNEIFORM SIGN U4 TIMES ONE N14
12A58		PROTO-CUNEIFORM SIGN TAG-A2	12A8B		PLUS TWO N01
12A59		PROTO-CUNEIFORM SIGN TAG-A3	12A8C		PROTO-CUNEIFORM SIGN U4 TIMES ONE N14
12A5A		PROTO-CUNEIFORM SIGN TAG-A4	12A8D		PLUS FOUR N01
12A5B		PROTO-CUNEIFORM SIGN TAG-B	12A8E		PROTO-CUNEIFORM SIGN U4 TIMES ONE N14
12A5C		PROTO-CUNEIFORM SIGN TAG-C	12A8F		PLUS SEVEN N01
12A5D		PROTO-CUNEIFORM SIGN TAG-D	12A8G		PROTO-CUNEIFORM SIGN U4 TIMES ONE N57
12A5E		PROTO-CUNEIFORM SIGN TAK4-A	12A8H		PLUS FOUR N01
12A5F		PROTO-CUNEIFORM SIGN TAK4-A NUTILLU	12A8I		PROTO-CUNEIFORM SIGN U4 TIMES THREE N01
12A60		PROTO-CUNEIFORM SIGN TAK4-C	12A8J		PLUS TWO N01
12A61		PROTO-CUNEIFORM SIGN TAR-A	12A8K		PROTO-CUNEIFORM SIGN U4 TIMES THREE N14
12A62		PROTO-CUNEIFORM SIGN TE	12A8L		PLUS FOUR N01
12A63		PROTO-CUNEIFORM SIGN TI	12A8M		PROTO-CUNEIFORM SIGN U4 TIMES THREE N14
12A64		PROTO-CUNEIFORM SIGN TI GUNU	12A8N		PLUS SEVEN N01
12A65		PROTO-CUNEIFORM SIGN TI REVERSED	12A8O		PROTO-CUNEIFORM SIGN U4 TIMES ONE N57
12A66		PROTO-CUNEIFORM SIGN TI TENU	12A8P		PLUS TWO N01
12A67		PROTO-CUNEIFORM SIGN TILLA2	12A8Q		PROTO-CUNEIFORM SIGN U4 TIMES TWO N57
12A68		PROTO-CUNEIFORM SIGN TU-A	12A8R		PROTO-CUNEIFORM SIGN U4 TIMES FOUR N57
12A69		PROTO-CUNEIFORM SIGN TU-B	12A8S		PROTO-CUNEIFORM SIGN U4 TIMES FIVE N57
12A6A		PROTO-CUNEIFORM SIGN TU-C	12A8T		PROTO-CUNEIFORM SIGN U4 TIMES SIX N57
12A6B		PROTO-CUNEIFORM SIGN TUG2-A	12A8U		PROTO-CUNEIFORM SIGN U4 TIMES SEVEN N57
12A6C		PROTO-CUNEIFORM SIGN TUG2-A GUNU	12A8V		PROTO-CUNEIFORM SIGN U4 TIMES EIGHT N57
12A6D		PROTO-CUNEIFORM SIGN TUG2-B	12A8W		PROTO-CUNEIFORM SIGN U4 TIMES ONE N57
12A6E		PROTO-CUNEIFORM SIGN TUG2-C	12A8X		PROTO-CUNEIFORM SIGN U4 TIMES ONE N58
12A6F		PROTO-CUNEIFORM SIGN TUM-A	12A8Y		TENU
12A70		PROTO-CUNEIFORM SIGN TUM-A GUNU	12A8Z		PROTO-CUNEIFORM SIGN U4 TENU
12A71		PROTO-CUNEIFORM SIGN TUM-B	12A9A		PROTO-CUNEIFORM SIGN U8
12A72		PROTO-CUNEIFORM SIGN TUM-C	12A9B		PROTO-CUNEIFORM SIGN U8 TIMES TAR-B
12A73		PROTO-CUNEIFORM SIGN TUM-D	12A9C		PROTO-CUNEIFORM SIGN UB
12A74		PROTO-CUNEIFORM SIGN TUN3-A	12A9D		PROTO-CUNEIFORM SIGN UBI-A
12A75		PROTO-CUNEIFORM SIGN TUN3-B	12A9E		PROTO-CUNEIFORM SIGN UBI-C
12A76		PROTO-CUNEIFORM SIGN TUN3-C	12A9F		PROTO-CUNEIFORM SIGN UBI-D
12A77		PROTO-CUNEIFORM SIGN TUR	12AA0		PROTO-CUNEIFORM SIGN UD5-A
12A78		PROTO-CUNEIFORM SIGN TUR GUNU	12AA1		PROTO-CUNEIFORM SIGN UD5-A GUNU
12A79		PROTO-CUNEIFORM SIGN TUR3-A	12AA2		PROTO-CUNEIFORM SIGN UD5-B
12A7A		PROTO-CUNEIFORM SIGN TUR3-B	12AA3		PROTO-CUNEIFORM SIGN UD5-C
12A7B		PROTO-CUNEIFORM SIGN TUR3-C	12AA4		PROTO-CUNEIFORM SIGN UDU-A

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			12B02		PROTO-CUNEIFORM SIGN ZI-D

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12BCD		PROTO-CUNEIFORM SIGN ZATU799	12BEB		LAGAB-A
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12BD9		PROTO-CUNEIFORM SIGN ZATU811	12BF7		PROTO-CUNEIFORM NUMERIC SIGN THREE N58
12BDA		PROTO-CUNEIFORM SIGN ZATU812	12BF8		PROTO-CUNEIFORM NUMERIC SIGN FOUR N58
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12BE2		PROTO-CUNEIFORM SIGN ZATU847			TENU

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