

Materials for Encoding Proto-Cuneiform

Appendix A

SEQUENCES DATA

This section describes three related things: how sequences should be encoded; how PCSL handles sequences; and one strategy for implementing sequences and their glyph variants using simple font features.

Sequences are not encoded

Following the Principles for Encoding Proto-Cuneiform, signs which are composed 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.

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 LU₂ and GAL. We call these sequences "opaque sequences" and, like regular sequences, they are not encoded.

Sequences have constant character names

In PCSL, the tag @sign is used for sign names and is dissociated from glyph names. All of the variants of a sequence are grouped under a single @sign. The sign name is composed of a conventional ordering of the sequence, with each component joined by periods ('.'). Each sign name is unique among the set of sign names.

If there is an attested simple linear sequence for a sequence character, that form is selected for the character name. The mnemonically named LUGAL occurs in a simple linear sequence as |GAL~a.LU₂|, so that is used as the name of the character.

Glyphs have unique names


PCSL uses a new tag, @glyph to clarify the separation of character names versus glyph names. Glyph names consist of a name conforming to an extended set of rules for grapheme naming and possibly a variant tag, consisting of a tilde and a sequence of one or more digits. One glyph name for LUGAL is |GAL~a.LU₂~a|~1. The variant tag is stable and represents a variation on the basic glyph name (i.e., the name with all joiners mapped to '.').

Glyph names only have to be unique among @glyph entries; a @sign and @glyph may have the same name.

How unique glyph names are constructed

Unique glyph names are constructed by varying the order and joiners of the grapheme notation in a way that reflects the variant's form. The joiners are '.' ("BESIDE"), '+' ("JOINING"), and '⌢' ("TURNING"), the ring operator. This last is an addition to ATF notation to support the description of sign clustering.

Glyph names do not encode internal glyph variation, i.e., several variant forms of IB are used in the construction of ŠAB (|PA.IB|).

Following the corpus-building rule that input text should not be reordered, glyph names do not reorder components. Where there is a reasonable choice of how to describe the order of components an order identical or closer to the sequence character name is preferred. Thus, in the case of character |PAP~a.IB~a|, the glyph  could reasonably be described as |PAP~a.IB~a| or |IB~a⌢PAP~a|. The former is preferred because it follows the character name.




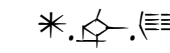








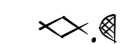


Similarly, glyph names do not remap or normalize variant components that are considered distinct signs in PCSL. Thus, for character |UŠ~a.KUR~a| there are glyphs |UŠ~a.KUR~a| and |UŠ~b.KUR~a|; for character |EN~a.EZEN~b×ŠE~a.NUN~a.SIG~7| there are glyphs and |EN~a.EZEN~b×ŠE~a@t⌢NUN~a.SIG~7| and |EN~a.BAHAR~2~b⌢SIG~7.ME~a.NUN~a|.



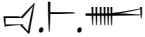





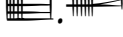




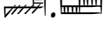


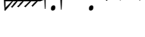

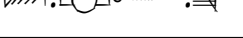












How glyph names are turned into ligatures










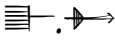


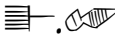


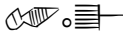





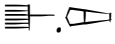
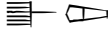
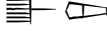





















Glyph names are turned into ligatures by taking the base component signs and joining them with the ZWJ, U+200D. Multiple glyph names may generate the same core ligature sequence, so CVnn tags are added to the second and subsequent duplicate core ligatures to disambiguate them. Thus, |ŠE~a.NAM~2| has two glyph forms, named |ŠE~a.NAM~2|~1 and |ŠE~a.NAM~2|~2. These are mapped, schematically, to ŠE~a.u200D.NAM~2 and ŠE~a.u200D.NAM~2.cv01. The CVnn used in the font is relative to the number of previous duplicate siblings of the glyph name; in the case of the character |GA~a.ZATU753| there are glyphs |GA~a.ZATU753|~1 and |ZATU753.GA~a|~1; neither ligature therefore requires a CVnn.



















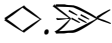

















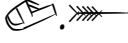








Note that in order for this approach to work it is important to specify the OpenType feature lookups in the correct order: liga must come before cv01 .. cvNN, and salt should come last. Unmarked liga should be in the liga table; liga.cvNN should be in the salt table.

In XeTeX, the features for the cvNN ligatures should be specified as "+cv01,+salt", "+cv02,+salt", "+cv03,+salt" (specifying +liga is unnecessary with XeTeX).

NAME/DECOMP	PUA	LIG/.liga
AMAR.1(N02) 	 F2222	 u126B4_u200D_u125BE.liga
AN.IM~a.GI_6 	 F2223	 u126B7_u200D_u12860_u200D_u1288E.liga
APIN~a.APIN~a 	 F2224	 u126BD_u200D_u126D2.liga
BU~b.NA~2~a 	 F2225	 u126ED_u200D_u12A10.liga
BULUG_3.DU_6~a 	 F2226	 u126F0_u200D_u12750.liga










































NAME/DECOMP	PUA	LIG/.liga
DA~a.LiŠ 	 F2227	 u126F6_u200D_u129B5.liga
DU.ME~a.NUN~a 	 F2084	 u1271E_u200D_u12905_u200D_u12A74.liga
DU.U ₄ 	 F2228	 u1271E_u200D_u129BE1.liga
E ₂ ~a.LiŠ 	 F2229	 u1277F_u200D_u129B5.liga
E ₂ ~a.NUN~a 	 F222A	 u1277F_u200D_u12A74.liga
E ₂ ~b.LiŠ 	 F222B	 u12781_u200D_u129B5.liga
EN~a.KID~a 	 F222C	 u12787_u200D_u12941.liga
EN~a.ME~a.GI 	 F222D	 u12787_u200D_u12905_u200D_u12878.liga
EN~a.ME~a.MU 	 F222E	 u12787_u200D_u12905_u200D_u129EC.liga
EN~a.EZEN~b×ŠE~a@t□NUN~a.SIG ₇ 	 F20CA	 u12787_u200D_u127A2_u200D_u1296F_u200D_u12AE3.liga
EN~a.BAHAR ₂ ~b□SIG ₇ .ME~a.NUN~a 	 F20CB	 u12787_u200D_u126CB_u200D_u129C6_u200D_u12905_u200D_u12A74.liga
EN ₂ .E ₂ ~a 	 F222F	 u1278D_u200D_u127CA.liga
EN ₂ .E ₂ ~b 	 F2230	 u1278D_u200D_u127CE.liga
EŠDA.NAM ₂ 	 F2141	 u12792_u200D_u12A23.liga



















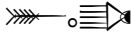


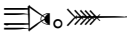























NAME/DECOMP	PUA	LIG/.liga
EŠDA+NAM ₂] 	 F2142	 u12792_u200D_u12A23.liga.cv01
GA~a.ZATU753] 	 F20D1	 u127A9_u200D_u12D79.liga
ZATU753.GA~a] 	 F20D0	 u12BA4_u200D_u1280E.liga
GAL~a.BUR ₂] 	 F2231	 u127DE_u200D_u1271F.liga
GAL~a.LU ₂] 	 F212A	 u127DE_u200D_u129B6.liga
LU ₂ □GAL~a] 	 F212B	 u128E2_u200D_u1284E.liga
GAL~a.NI~a] 	 F2232	 u127DE_u200D_u12A3A.liga
GAL~a.NIM~a] 	 F2233	 u127DE_u200D_u12A43.liga
GAL~a.UKKIN~a] 	 F2110	 u127DE_u200D_u12C31.liga
GAL~a.UKKIN~a ~1 	 F2111	 u127DE_u200D_u12C31.liga.cv01
GEŠTU~a.NAGA~a] 	 F2234	 u127F9_u200D_u12A16.liga
GI ₆ .NUNUZ~c] 	 F2235	 u1280F_u200D_u12A87.liga
GIR~a.KU ₆ ~a] 	 F2236	 u12811_u200D_u12965.liga
GIR~b.GIR~b] 	 F2237	 u12812_u200D_u12896.liga
GIR ₃ ~c.AB~a] 	 F2238	 u12818_u200D_u12698.liga











































NAME/DECOMP	PUA	LIG/.liga
GIR ₃ ~c.PIRIG~b1 	 F2239	 u12818_u200D_u12A98.liga
GiŠ.TE 	 F223A	 u1281F_u200D_u12BB9.liga
GiŠ@t.E ₂ ~a 	 F223B	 u12825_u200D_u127CA.liga
GU ₄ .ZATU755~b 	 F223C	 u12832_u200D_u12D7C.liga
GUKKAL~a.HI@g~a 	 F223D	 u1283C_u200D_u128F0.liga
HI.LAGAB~a 	 F223E	 u12851_u200D_u12980.liga
HI.SUHUR 	 F20F6	 u12851_u200D_u12B23.liga
HI.SUHUR ~1 	 F20F7	 u12851_u200D_u12B23.liga.cv01
HI.SUHUR ~2 	 F20F5	 u12851_u200D_u12B23.liga.cv02
HI×1(N57)◻HI×1(N57) 	 F20F9	 u12852_u200D_u128EC.liga
HI×1(N57).HI×1(N57) 	 F20F8	 u12852_u200D_u128EC.liga.cv01
IR~a.GA ₂ ~a1 	 F223F	 u12864_u200D_u12815.liga
KA~a.ŠE~a 	 F2109	 u1286B_u200D_u12B52.liga
KA~a.ŠE~a@t 	 F2108	 u1286B_u200D_u12B57.liga
KAK~a.GA ₂ ~a1 	 F2240	 u12873_u200D_u12815.liga

NAME/DECOMP	PUA	LIG/.liga
KU ₆ ~a.Giš 	 F2241	 u128AA_u200D_u128A7.liga
KU ₆ ~a.1(N02) 	 F2242	 u128AA_u200D_u125BE.liga
KUR~a.E ₂ ~a 	 F2243	 u128AD_u200D_u127CA.liga
KUR~a.NUNUZ~a1 	 F2244	 u128AD_u200D_u12A82.liga
KUR~a.RU 	 F21A7	 u128AD_u200D_u12AA5.liga
KUR~a.RU ~1 	 F21A6	 u128AD_u200D_u12AA5.liga.cv01
KUR~b.E ₂ ~a 	 F2245	 u128AE_u200D_u127CA.liga
LAGAB~b.TE 	0	 u128CD_u200D_u12BB9.liga
ME~a.EN~a□ŠE~a□ŠA 	 F2246	 u12905_u200D_u12787_u200D_u12A1F_u200D_u12B37.liga
MUŠ ₃ ~a.AB~a 	 F2247	 u1291E_u200D_u12698.liga
MUŠ ₃ ~a.ERIN 	 F2248	 u1291E_u200D_u127EF.liga
MUŠ ₃ ~a.UNUG~a 	 F2249	 u1291E_u200D_u12C44.liga
MUŠEN.UR ₃ ~b2 	 F224A	 u12921_u200D_u12C58.liga
MUŠEN.3(N58) 	 F221C	 u12921_u200D_uF011C.liga

NAME/DECOMP	PUA	LIG/.liga
1(N02).RU 	 F2211	 u125BE_u200D_u12AA5.liga
NAGAR~a.BU~a 	 F224B	 u12930_u200D_u1270B.liga
NAGAR~b.BU~a 	 F224C	 u12931_u200D_u1270B.liga
NE~a□GI 	 F20E4	 u1293D_u200D_u12878.liga
NE~c□GI 	 F20E3	 u1293F_u200D_u12878.liga
NE~a.RU 	 F224D	 u1293D_u200D_u12AA5.liga
NI~a.RU 	 F224E	 u12943_u200D_u12AA5.liga
NUN~a.ME~a 	 F2082	 u1296F_u200D_u129E2.liga
NUN~a+ME~a 	 F2083	 u1296F_u200D_u129E2.liga.cv01
NUN~a.ME~a.DU 	 F2085	 u1296F_u200D_u12905_u200D_u1274D.liga
NUN~b.U₄ 	0	 u12975_u200D_u12BE1.liga
PA~a□IB~a 	 F2182	 u1297E_u200D_u128F4.liga
PA~a.IB~a 	 F2181	 u1297E_u200D_u128F4.liga.cv01
PA~a□IB~a ~1 	 F2183	 u1297E_u200D_u128F4.liga.cv02
PA~a.TE.SI 	 F224F	 u1297E_u200D_u12A60_u200D_u12AC7.liga






































NAME/DECOMP	PUA	LIG/.liga
PA~a.UDU~a 	 F2171	 u1297E..u200D..u12C25.liga
PA~a.UDU~a ~1 	 F2172	 u1297E..u200D..u12C25.liga.cv01
PAP~a.IB~a 	 F2184	 u12982..u200D..u128F4.liga
IB~a□PAP~a 	 F2185	 u12858..u200D..u12A91.liga
SAL.KUR~a 	 F2250	 u1299E..u200D..u1296C.liga
SAL.LAGAR~a 	 F2251	 u1299E..u200D..u129A0.liga
SAL.LAM~b 	 F2252	 u1299E..u200D..u129B1.liga
SAL.ME~a 	0	 u1299E..u200D..u129E2.liga
SAL.NAM ₂ 	 F2253	 u1299E..u200D..u12A23.liga
SAL.NAM ₂ .EZEN~b×ŠE~a@t□NUN~a.SIG ₇ 	 F2254	 u1299E..u200D..u12936..u200D..u127A2..u200D..u1296F..u200D..u12AE3.liga
SAL.SI 	 F2255	 u1299E..u200D..u12AC7.liga
SAL.SILA ₄ ~c 	 F2256	 u1299E..u200D..u12B15.liga
SAL.ŠU ₂ 	 F2257	 u1299E..u200D..u12B98.liga
SAL.ZATU751~a 	 F2258	 u1299E..u200D..u12D75.liga

NAME/DECOMP	PUA	LIG/.liga
SAL.ZATU751~b 	 F2259	 u1299E_u200D_u12D76.liga
SAL.ZATU751~c 	 F225A	 u1299E_u200D_uF300F.liga
SU~a.KUR~a.RU 	 F225B	 u129F4_u200D_u128AD_u200D_u12AA5.liga
ŠE~a.KIN ₂ ~c 	 F2189	 u12A1F_u200D_u12948.liga
ŠE~a.NAM ₂ 	 F218B	 u12A1F_u200D_u12A23.liga
ŠE~a.NAM ₂ -1 	 F218C	 u12A1F_u200D_u12A23.liga.cv01
ŠE~a□ŠA 	 F2126	 u12A1F_u200D_u12B37.liga
ŠA□ŠE~a 	 F2127	 u12A0C_u200D_u12B52.liga
ŠE~a@t.KIN ₂ ~c 	 F218A	 u12A22_u200D_u12948.liga
ŠEŠ~a.NA~a 	 F225C	 u12A31_u200D_u12A0B.liga
ŠITA~a1.MUD ₃ ~a 	 F225D	 u12A38_u200D_u129EF.liga
ŠU ₂ .E ₂ ~a 	 F225E	 u12A49_u200D_u127CA.liga
ŠU ₂ .E ₂ ~b 	 F225F	 u12A49_u200D_u127CE.liga
ŠU ₂ .EN~a 	 F21A1	 u12A49_u200D_u127D9.liga
ŠU ₂ .EN~a ~1 	 F219F	 u12A49_u200D_u127D9.liga.cv01


































NAME/DECOMP	PUA	LIG/.liga
ŠU ₂ .EN~a ~2 	 F21A0	 u12A49_u200D_u127D9.liga.cv02
ŠU ₂ .EN~b 	 F2260	 u12A49_u200D_u127DA.liga
ŠU ₂ .GIŠ 	 F2261	 u12A49_u200D_u128A7.liga
ŠU ₂ .(HI×1(N57)).(HI×1(N57)) 	 F2262	 u12A49_u200D_u12852_u200D_u128EC.liga
ŠU ₂ .PAP~a 	 F221D	 u12A49_u200D_u12A91.liga
ŠU ₂ .AN 	 F219E	 u12A49_u200D_u126CC.liga
ŠU ₂ .URI ₃ ~a 	 F2263	 u12A49_u200D_u12C5F.liga
ŠU ₂ .1(N02) 	 F2264	 u12A49_u200D_u125BE.liga
ŠU ₂ .1(N24) 	 F2265	 u12A49_u200D_u125AA.liga
ŠU ₂ .2(N57) 	 F2266	 u12A49_u200D_uF0111.liga
TE.A 	 F2267	 u12A60_u200D_u12690.liga
TUG ₂ ~a.BAD&BAD 	 F2268	 u12A69_u200D_u126E0.liga
TUR ₃ ~a.5(N57) 	 F221E	 u12A77_u200D_uF0114.liga
U ₄ .AB~b 	 F2269	 u12A7D_u200D_u126A3.liga

NAME/DECOMP	PUA	LIG/.liga
U ₄ .5U ₂] 𐌲.𐌲	𐌲 ₅ F226A	𐌲 ₅ u12A7D_u200D_u12B98.liga
U ₄ .1(N08) 𐌲.𐌶	𐌲 ₆ F226B	𐌲 ₆ u12A7D_u200D_u12559.liga
U ₄ .2(N08) 𐌲.𐌷	𐌲 ₇ F226C	𐌲 ₇ u12A7D_u200D_u1255A.liga
U ₄ .3(N08) 𐌲.𐌸	𐌲 ₈ F226D	𐌲 ₈ u12A7D_u200D_u1255B.liga
U ₄ .4(N08) 𐌲.𐌹	𐌲 ₉ F226E	𐌲 ₉ u12A7D_u200D_u1255C.liga
U ₄ .5(N08) 𐌲.𐌺	𐌲 ₁₀ F226F	𐌲 ₁₀ u12A7D_u200D_u1255D.liga
U ₄ .6(N08) 𐌲.𐌻	𐌲 ₁₁ F2270	𐌲 ₁₁ u12A7D_u200D_u1255E.liga
U ₄ .7(N08) 𐌲.𐌼	𐌲 ₁₂ F2271	𐌲 ₁₂ u12A7D_u200D_u1255F.liga
U ₄ .8(N08) 𐌲.𐌽	𐌲 ₁₃ F2272	𐌲 ₁₃ u12A7D_u200D_u12560.liga
U ₄ .1(N14) 𐌲.𐌾	𐌲 ₁₄ F2273	𐌲 ₁₄ u12A7D_u200D_u12562.liga
U ₄ .1(N14).1(N08) 𐌲.𐌾.𐌶	0	𐌲 ₁₄ .𐌶 ₆ u12A7D_u200D_u12562_u200D_u12559.liga
U ₄ .1(N14).3(N08) 𐌲.𐌾.𐌸	𐌲 ₁₄ .𐌸 ₈ F2274	𐌲 ₁₄ .𐌸 ₈ u12A7D_u200D_u12562_u200D_u1255B.liga
U ₄ .1(N14).4(N08) 𐌲.𐌾.𐌹	𐌲 ₁₄ .𐌹 ₉ F2275	𐌲 ₁₄ .𐌹 ₉ u12A7D_u200D_u12562_u200D_u1255C.liga
U ₄ .1(N14).5(N08) 𐌲.𐌾.𐌺	𐌲 ₁₄ .𐌺 ₁₀ F2276	𐌲 ₁₄ .𐌺 ₁₀ u12A7D_u200D_u12562_u200D_u1255D.liga

NAME/DECOMP	PUA	LIG/.liga
U ₄ .1(N14).8(N08) 	F2277	u12A7D_u200D_u12562_u200D_u12560.liga
U ₄ .2(N14) 	F2278	u12A7D_u200D_u12563.liga
U ₄ .1(N24) 	F2279	u12A7D_u200D_u125AA.liga
U ₄ ×1(N01).5(N08) 	F227A	u12A7E_u200D_u1255D.liga
U ₄ ×2(N01).2(N14) 	F227B	uF2485_u200D_u12563.liga
U ₄ ×2(N01).2(N14).1(N08) 	F227C	uF2485_u200D_u12563_u200D_u12559.liga
U ₄ ×3(N01).3(N08) 	F227D	u12A80_u200D_u1255B.liga
U ₄ ×4(N01).2(N14) 	F227E	u12A81_u200D_u12563.liga
U ₄ ×5(N01).1(N14) 	F227F	u12A82_u200D_u12562.liga
U ₄ ×(1(N14).3(N01)).1(N14).4(N08) 	F221F	uF254D_u200D_u12562_u200D_u1255C.liga
URI ₃ ~a.AB~a 	F2280	u12AD2_u200D_u12698.liga
URI ₃ ~a.IB~a 	F2281	u12AD2_u200D_u128F4.liga
URI ₃ ~a.□NA~a 	F2144	u12AD2_u200D_u12A0B.liga
URI ₃ ~a.NA~a 	F2143	u12AD2_u200D_u12A0B.liga.cv01

NAME/DECOMP	PUA	LIG/.liga
URl ₃ ~a.NA~a ~1 	 F2145	 u12AD2_u200D_u12A0B.liga.cv02
URl ₃ ~a.UNUG~a 	 F2282	 u12AD2_u200D_u12C44.liga
UŠ~a.KUR~a 	 F20FF	 u12AE7_u200D_u1296C.liga
UŠ~b.KUR~a 	 F20FE	 u12AE9_u200D_u1296C.liga
ZATU714.RU 	 F2283	 u12B74_u200D_u12AA5.liga
1(N57).AB ₂ 	 F2284	 u12BE9_u200D_u126A7.liga
2(N57).AB ₂ 	 F2285	 u12BEA_u200D_u126A7.liga
3(N57).AMAR 	 F2286	 u12BEB_u200D_u126C5.liga
4(N57).AMAR 	 F2287	 u12BEC_u200D_u126C5.liga
3(N57).AZ 	0	 u12BEB_u200D_u126DC.liga
3(N57).BAR×UŠ~a 	 F2288	 u12BEB_u200D_uF3095.liga
3(N57).BARA ₃ 	 F2289	 u12BEB_u200D_u12702.liga
2(N57).BIR ₃ ~a 	 F228A	 u12BEA_u200D_u12706.liga
1(N57).BU ₃ 	0	 u12BE9_u200D_u12718.liga

NAME/DECOMP	PUA	LIG/.liga
2(N57).DU ₆ ~a@n =.𐤳	0	=𐤳 u12BEA_u200D_uF3089.liga
1(N57).E ₂ ~a =𐤱	𐤱 F228B	𐤱 u12BE9_u200D_u127CA.liga
3(N57).E ₂ ~b =𐤱	𐤱 F228C	𐤱 u12BEB_u200D_u127CE.liga
3(N57).EN ₂ =𐤱	0	=𐤱 u12BEB_u200D_u127E3.liga
3(N57).GAR =𐤱	𐤱 F228D	𐤱 u12BEB_u200D_u12868.liga
4(N57).GAR =𐤱	𐤱 F228E	𐤱 u12BEC_u200D_u12868.liga
5(N57).GAR =𐤱	𐤱 F228F	𐤱 u12BED_u200D_u12868.liga
6(N57).GAR =𐤱	𐤱 F2290	𐤱 u12BEE_u200D_u12868.liga
7(N57).GAR =𐤱	𐤱 F2221	𐤱 u12BEF_u200D_u12868.liga
4(N57).KU ₃ ~a =𐤱	𐤱 F2291	𐤱 u12BEC_u200D_u12963.liga
5(N57).KU ₃ ~a =𐤱	𐤱 F2292	𐤱 u12BED_u200D_u12963.liga
6(N57).KU ₃ ~a =𐤱	𐤱 F2293	𐤱 u12BEE_u200D_u12963.liga
2(N57).KU ₆ ~a =𐤱	𐤱 F2294	𐤱 u12BEA_u200D_u12965.liga
3(N57).LAM~a.KUR~a.RU =𐤱	𐤱 F2295	𐤱 u12BEB_u200D_u128DD_u200D_u128AD_u200D_u12AA5.liga

NAME/DECOMP	PUA	LIG/.liga
1(N57).MUŠEN — . 	 F2296	 u12BE9_u200D_u12A05.liga
2(N57).MUŠEN = . 	 F2297	 u12BEA_u200D_u12A05.liga
3(N57).MUŠEN ≡ . 	 F2298	 u12BEB_u200D_u12A05.liga
3(N57).NUNUZ~a1 ≡ . 	 F2299	 u12BEB_u200D_u12A82.liga
3(N57).NUNUZ~c ≡ . 	 F229A	 u12BEB_u200D_u12A87.liga
3(N57).PIRIG~b1 ≡ . 	 F229B	 u12BEB_u200D_u12A98.liga
3(N57).RU ≡ . 	 F21A9	 u12BEB_u200D_u12AA5.liga
3(N57).RU ~1 ≡ . 	 F21A8	 u12BEB_u200D_u12AA5.liga.cv01
3(N57).SANGA~a ≡ . 	0	 u12BEB_u200D_u12ABC.liga
3(N57).SI ≡ . 	0	 u12BEB_u200D_u12AC7.liga
1(N57).SIG — . 	 F229C	 u12BE9_u200D_u12ACF.liga
2(N57).SU~a = . 	 F229D	 u12BEA_u200D_u12B1D.liga
1(N57).ŠAH₂~a — . 	 F229E	 u12BE9_u200D_u12B49.liga
ŠUBUR×1(N57)  —	 F2212	 u12A4B_u200D_uF0110.liga

NAME/DECOMP	PUA	LIG/.liga
1(N57).ŠUBUR - . } □	𐤔𐤁𐤏𐤕 F2213	𐤔𐤁𐤏𐤕 u12BE9_u200D_u12B9E.liga
2(N57).ŠUBUR = . } □	𐤔𐤁𐤏𐤕 F229F	𐤔𐤁𐤏𐤕 u12BEA_u200D_u12B9E.liga
3(N57).ŠUBUR ≡ . } □	𐤔𐤁𐤏𐤕 F22A0	𐤔𐤁𐤏𐤕 u12BEB_u200D_u12B9E.liga
3(N57).UDU~a ≡ . ⊕	𐤔𐤁𐤏𐤕 F22A1	𐤔𐤁𐤏𐤕 u12BEB_u200D_u12C25.liga
2(N57).UDUNITA~a = . ⊕ ◇	𐤔𐤁𐤏𐤕 F22A2	𐤔𐤁𐤏𐤕 u12BEA_u200D_u12C2A.liga
3(N57).UDUNITA~a ≡ . ⊕ ◇	𐤔𐤁𐤏𐤕 F22A3	𐤔𐤁𐤏𐤕 u12BEB_u200D_u12C2A.liga
1(N57).URU~a1 - . □	𐤔𐤁𐤏𐤕 F22A4	𐤔𐤁𐤏𐤕 u12BE9_u200D_u12C63.liga
2(N57).URU~a1 = . □	𐤔𐤁𐤏𐤕 F22A5	𐤔𐤁𐤏𐤕 u12BEA_u200D_u12C63.liga