

ISO/IEC JTC 1/SC 2/WG 2 **N3448**

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TITLE: Comments on N3297: Proposal to encode Tangut characters in UCS Plane 1 and Charts

SOURCE: UK National Body

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ACTION: For consideration by WG2

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The UK welcomes the proposal to encode the Tangut script, and wishes to express its appreciation to Dr. Richard Cook for a detailed and well thought out proposal.

However, it is important that a proposal of this magnitude is carefully reviewed by experts in the field of Tangut studies, and that there is broad consensus on the character repertoire and ordering. We have been in contact with a number of Tangut scholars, and whilst we have had some positive feedback, we have been told that more time is required to thoroughly review the proposal and check all of the nearly 6,000 proposed characters. We would therefore not wish to see the proposal added to an amendment at this stage.

One issue in particular that has been raised is the question of Tangut radicals. Almost all the modern Tangut dictionaries include a radical-based index of Tangut characters. Some examples are appended to this document:

- Appendix A : Table of 357 radicals used in Li Fanwen's *Xia-Han Zidian* 夏漢字典 (Beijing, 1997)
- Appendix B : Table of 444 radicals used in *Wenhai Yanjiu* 文海研究 (Beijing, 1983)
- Appendix C : Table of 329 radicals used in Tatsuo Nishida's *Seikabun Kojiten* 西夏文小字典 (Tokyo, 1964)

We believe that it is essential that the Tangut proposal includes a set of radicals, so that radical indices such as these can be represented in electronic text. Note that unlike Han radicals, the majority of Tangut radicals defined in these dictionaries do not exist as free-form characters and so cannot be represented unless they are separately encoded. The actual radical scheme used varies from author to author, so we strongly recommend that the set of Tangut radical characters encoded is a superset of all the radicals used in the various dictionaries.

Furthermore, in addition to the actual radicals used in dictionaries there are a relatively small number of other recurring elements found in Tangut characters that it would be advisable to encode (these mostly occur as the right hand side component of characters, but have not been used as radicals in dictionaries as most Tangut radicals are artificially chosen from the topmost or left side component of a character). It would be very useful to encode all component elements used in Tangut characters, not just those used as radicals, for use in discussion of the composition of Tangut characters (something that is very important to scholars of the Tangut script) and for use in component-based input methods for the Tangut script.

Finally, we would like the proposal to address Tangut character strokes. Most Tangut strokes are the same as strokes used for Han ideographs, but there may be some strokes peculiar to Tangut that it would be beneficial to encode (we suggest adding any such strokes to the space at the end of the CJK Strokes block, 31E4..31EF). For example, Li Fanwen's *Tangut-Chinese Dictionary* shows 24 basic strokes:

甲 筆形和代號：

筆名	號碼	筆形	字例	說明	
單筆	橫	1	一 一 ㄇ	𐰇 𐰈 𐰉 𐰊	橫和橫上下鈎
	垂	2	/ \	𐰋 𐰌 𐰍 𐰎	直和撇
	點	3	、 丶	𐰏 𐰐 𐰑 𐰒	點和捺
復筆	又	4	× 十 卄	𐰓 𐰔 𐰕 𐰖	兩筆交叉和橫穿一筆
	卌	5	卌 卌 卌	𐰗 𐰘 𐰙 𐰚	一筆橫穿三筆, 直穿二至三筆
	卍	6	卍 卍	𐰛 𐰜	一筆橫、直穿四筆
筆	角	7	厂 ㄟ ㄥ	𐰝 𐰞 𐰟 𐰠	一筆轉折和兩筆相接而成的角
	八	8	ㄨ ㄨ	𐰡 𐰢 𐰣 𐰤	類似漢字八和八的變形
	小	9	ㄣ 卍 卍	𐰥 𐰦 𐰧 𐰨	類似漢字小和小的變形

Appendix A : Table of radicals used in Li Fanwen's *Xia-Han Zidian* 夏漢字典 (Beijing, 1997)

(一) 筆畫部首

筆 畫	部 首			
	、 點	一 橫	豎	丿 撇
一 畫		一 1 7 1	1	丿 3 4 3
二 畫	㇇ 4 7 4	二 5 ㇇ 5 ㇇ 6 ㇇ 6 ㇇ 7	7 ㇇ 9 ㇇ 9	㇇ 9 ㇇ 11

<p>三 畫</p>	<p>十 11 广 11 艸 12 了 15 ㄣ 15</p>	<p>亅 16 于 16 冫 16 冫 16 𠂇 17 𠂇 17 才 17 才 17 彳 17 彳 18 彳 19 彳 19 云 19 艸 20 彳 20 艸 20 彳 20</p>	<p>尸 20 巾 20 巾 20 冂 21</p>	<p>彳 18 彳 21 冫 21 女 21 彳 21 彳 22 彳 22</p>
<p>四 畫</p>	<p>爻 22 冫 22 九 22 冫 22 冫 23 九 23 彳 24 彳 24 彳 24 彳 24 彳 24 彳 25</p>	<p>冫 25 冫 26 冫 26 冫 26 冫 26 冫 27 冫 27 彳 27 彳 27 彳 27 彳 28 彳 28 彳 29 彳 29 彳 29 彳 29 彳 31 彳 31 彳 32 彳 32 云 33 彳 33</p>	<p>冫 37 彳 37 冫 37 彳 37 冫 37</p>	<p>彳 37 彳 37 冫 37 冫 37 彳 38 彳 38 彳 38 彳 38 彳 44 彳 44 彳 45 彳 45</p>
<p>五 畫</p>	<p>爻 45 冫 45 彳 46 彳 46 彳 46 冫 46 彳 46 彳 46 冫 46 冫 46 冫 46 冫 47 冫 47 彳 47 彳 47 彳 47 彳 47 彳 48 彳 48 彳 49 彳 49</p>	<p>彳 49 冫 49 冫 49 冫 49 冫 49 冫 49 冫 49 冫 50 冫 50 冫 50 冫 50 冫 50 冫 50 冫 50 冫 50 冫 51 彳 51 彳 51 彳 51 彳 51 彳 51 彳 51 彳 51 彳 51 冫 51 冫 51 冫 51 冫 52 冫 52 冫 52 冫 52 冫 52 冫 52 彳 53 彳 53 冫 53 彳 53 彳 53 彳 53 彳 53 冫 53 彳 53 彳 54</p>	<p>冫 55 冫 55 冫 55 冫 55 冫 55 冫 55</p>	<p>彳 55 彳 57 彳 58 彳 58 冫 58 冫 59 彳 59 彳 59 冫 59 冫 59 彳 59 冫 59</p>
<p>六 畫</p>	<p>彳 60 冫 60 冫 60 冫 60 冫 60 彳 61 冫 61 冫 61 冫 61 冫 61 冫 61 冫 61 彳 61 彳 61 彳 63 彳 64 冫 64 冫 64 冫 64 彳 65 冫 65</p>	<p>冫 65 冫 65 冫 65 冫 65 冫 65 彳 65 彳 65 彳 65 冫 65 彳 65 彳 65 彳 65 彳 66 冫 66 冫 66 冫 66 冫 66 冫 66 冫 66 冫 66 冫 67 冫 67 冫 67 彳 67 彳 67 彳 67 冫 67 冫 67</p>	<p>冫 67 冫 67 冫 67 冫 67 冫 67</p>	<p>彳 67 彳 68 彳 68 冫 68 冫 68 彳 68 冫 68 冫 68 冫 68 冫 68</p>

<p>七 畫</p>	<p>𦏧⁶⁹ 𦏨⁶⁹ 𦏩⁶⁹ 𦏪⁶⁹ 𦏫⁶⁹ 𦏬⁶⁹ 𦏭⁶⁹ 𦏮⁶⁹ 𦏯⁶⁹ 𦏰⁶⁹ 𦏱⁶⁹ 𦏲⁶⁹ 𦏳⁶⁹ 𦏴⁶⁹ 𦏵⁶⁹ 𦏶⁶⁹ 𦏷⁶⁹ 𦏸⁶⁹ 𦏹⁶⁹ 𦏺⁷⁰ 𦏻⁷⁰ 𦏼⁷⁰ 𦏽⁷¹</p>	<p>𦏾⁷¹ 𦏿⁷¹ 𦐀⁷¹ 𦐁⁷¹ 𦐂⁷¹ 𦐃⁷¹ 𦐄⁷¹ 𦐅⁷¹ 𦐆⁷¹ 𦐇⁷¹ 𦐈⁷¹ 𦐉⁷¹ 𦐊⁷¹ 𦐋⁷¹ 𦐌⁷¹ 𦐍⁷¹ 𦐎⁷² 𦐏⁷² 𦐐⁷² 𦐑⁷² 𦐒⁷² 𦐓⁷² 𦐔⁷² 𦐕⁷² 𦐖⁷² 𦐗⁷² 𦐘⁷² 𦐙⁷³ 𦐚⁷³</p>		<p>𦐛⁷³ 𦐜⁷³</p>
<p>八 畫</p>	<p>𦐝⁷⁴ 𦐞⁷⁴ 𦐟⁷⁴ 𦐠⁷⁴ 𦐡⁷⁴ 𦐢⁷⁴ 𦐣⁷⁴ 𦐤⁷⁴ 𦐥⁷⁴ 𦐦⁷⁴ 𦐧⁷⁴ 𦐨⁷⁴ 𦐩⁷⁴ 𦐪⁷⁴ 𦐫⁷⁴ 𦐬⁷⁴ 𦐭⁷⁴ 𦐮⁷⁴ 𦐯⁷⁴</p>	<p>𦐰⁷⁴ 𦐱⁷⁴ 𦐲⁷⁴ 𦐳⁷⁴ 𦐴⁷⁴ 𦐵⁷⁴ 𦐶⁷⁵ 𦐷⁷⁵ 𦐸⁷⁵ 𦐹⁷⁵ 𦐺⁷⁵ 𦐻⁷⁵</p>	<p>𦐼⁷⁵ 𦐽⁷⁵</p>	
<p>九 畫 以 上</p>	<p>𦐾⁷⁵ 𦐿⁷⁵ 𦑀⁷⁵ 𦑁⁷⁵ 𦑂⁷⁵ 𦑃⁷⁵ 𦑄⁷⁵ 𦑅⁷⁶ 𦑆⁷⁶ 𦑇⁷⁶ 𦑈⁷⁶</p>	<p>𦑉⁷⁵ 𦑊⁷⁵ 𦑋⁷⁵ 𦑌⁷⁶ 𦑍⁷⁶ 𦑎⁷⁶ 𦑏⁷⁶ 𦑐⁷⁶ 𦑑⁷⁶ 𦑒⁷⁶ 𦑓⁷⁶ 𦑔⁷⁶</p>		

Appendix B : Table of radicals used in *Wenhai Yanjiu* 文海研究 (Beijing, 1983)

一部首表

一	674	工	679	折	681	𠃉	685	羊	689	𠃉	691
一	674	工	679	𠃉	681	𠃉	685	𠃉	689	𠃉	691
一	674	𠃉	679	𠃉	681	𠃉	685	𠃉	689	𠃉	691
一	674	𠃉	679	𠃉	681	𠃉	685	𠃉	689	𠃉	691
一	675	𠃉	679	𠃉	681	𠃉	685	𠃉	690	𠃉	691
一	676	𠃉	679	𠃉	681	𠃉	685	𠃉	690	𠃉	691
一	676	𠃉	679	𠃉	682	𠃉	686	𠃉	690	𠃉	691
一	676	𠃉	679	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	679	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
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一	676	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	677	𠃉	680	𠃉	682	𠃉	686	𠃉	690	𠃉	692
一	677	𠃉	680	𠃉	683	𠃉	686	𠃉	690	𠃉	692
一	677	𠃉	680	𠃉	684	𠃉	686	𠃉	690	𠃉	692
一	677	𠃉	680	𠃉	684	𠃉	686	𠃉	690	𠃉	692
一	677	𠃉	680	𠃉	684	𠃉	686	𠃉	690	𠃉	692
一	678	𠃉	681	𠃉	684	𠃉	686	𠃉	691	𠃉	692
一	678	𠃉	681	𠃉	684	𠃉	686	𠃉	691	𠃉	692
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一	679	𠃉	681	𠃉	685	𠃉	686	𠃉	691	𠃉	693
一	679	𠃉	681	𠃉	685	𠃉	686	𠃉	691	𠃉	693

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Appendix C : Table of radicals used in Tatsuo Nishida's *Seikabun Kojiten* 西夏文小字典 (Tokyo, 1964)

西夏文字小字典目次

001 一	309	028 𠂇	344	055 𠂇	365
002 厂	310	029 𠂇	346	056 𠂇	364
003 二	311	030 𠂇	346	057 𠂇	365
004 𠂇	311	031 介	346	058 𠂇	365
005 一	312	032 𠂇	347	059 𠂇	365
006 厂	312	033 𠂇	347	060 𠂇	366
007 二	313	034 𠂇	348	061 𠂇	366
008 𠂇	319	035 𠂇	348	062 𠂇	367
009 二	320	036 𠂇	348	063 𠂇	367
010 二	322	037 𠂇	348	064 𠂇	367
011 𠂇	324	038 𠂇	349	065 𠂇	367
012 𠂇	324	039 𠂇	349	066 𠂇	367
013 二	324	040 𠂇	353	067 𠂇	367
014 二	324	041 𠂇	353	068 𠂇	367
015 𠂇	324	042 𠂇	359	069 𠂇	368
016 𠂇	324	043 𠂇	359	070 𠂇	368
017 𠂇	324	044 𠂇	359	071 𠂇	369
018 𠂇	334	045 𠂇	359	072 𠂇	369
019 𠂇	337	046 𠂇	360	073 𠂇	369
020 𠂇	338	047 𠂇	360	074 𠂇	370
021 𠂇	339	048 𠂇	361	074b 𠂇	370
022 𠂇	340	049 𠂇	361	075 𠂇	370
023 𠂇	340	050 𠂇	362	076 𠂇	371
024 𠂇	340	051 𠂇	362	077 𠂇	371
025 𠂇	340	052 𠂇	363	078 𠂇	371
026 𠂇	340	053 𠂇	363	079 𠂇	372
027 𠂇	343	054 𠂇	363	080 𠂇	372

西夏文字小字典目次

081	𐄂	373	111	𐄂	389	140	𐄂	398
082	𐄃	374	112	𐄃	389	141	𐄃	399
083	𐄄	374	113	𐄄	390	142	𐄄	993
084	𐄅	374	114	𐄅	390	143	𐄅	993
085	𐄆	374	115	𐄆	390	144	𐄆	399
086	𐄇	375	116	𐄇	390	145	𐄇	401
087	𐄈	375	117	𐄈	391	146	𐄈	401
088	𐄉	376	118	𐄉	391	147	𐄉	401
089	𐄊	376	119	𐄊	391	147b	𐄊	402
090	𐄋	377	120	𐄋	391	148	𐄋	402
091	𐄌	377	121	𐄌	391	149	𐄌	402
092	𐄍	377	122	𐄍	392	150	𐄍	402
093	𐄎	377	123	𐄎	392	151	𐄎	402
094	𐄏	377	123b	𐄎	394	152	𐄎	402
095	𐄐	377	124	𐄎	394	153	𐄎	403
096	𐄑	377	125	𐄎	394	154	𐄎	403
097	𐄒	378	126	𐄎	394	155	𐄎	403
098	𐄓	378	127	𐄎	394	156	𐄎	404
099	𐄔	379	128	𐄎	394	157	𐄎	404
100	𐄕	380	129	𐄎	395	158	𐄎	405
101	𐄖	380	130	𐄎	395	159	𐄎	405
102	𐄗	380	131	𐄎	395	159b	𐄎	406
103	𐄘	382	132	𐄎	395	160	𐄎	406
104	𐄙	383	133	𐄎	395	161	𐄎	406
105	𐄚	383	134	𐄎	396	162	𐄎	407
106	𐄛	384	135	𐄎	396	163	𐄎	407
107	𐄜	385	136	𐄎	397	164	𐄎	407
108	𐄝	386	137	𐄎	397	165	𐄎	408
109	𐄞	387	138	𐄎	397	166	𐄎	408
110	𐄟	388	139	𐄎	397	167	𐄎	498

西夏文字小字典目次

168	𐞗	408	198	𐞗	428	228	𐞗	465
169	𐞗	408	199	𐞗	438	229	𐞗	466
170	𐞗	408	200	𐞗	428	230	𐞗	466
171	𐞗	408	201	𐞗	428	231	𐞗	468
172	𐞗	409	202	𐞗	429	232	𐞗	468
173	𐞗	409	203	𐞗	430	233	𐞗	469
174	𐞗	409	204	𐞗	431	234	𐞗	469
175	𐞗	409	205	𐞗	449	235	𐞗	469
176	𐞗	409	206	𐞗	451	235b	𐞗	470
177	𐞗	410	207	𐞗	451	236	𐞗	471
178	𐞗	410	208	𐞗	451	237	𐞗	476
179	𐞗	410	209	𐞗	452	238	𐞗	476
180	𐞗	410	210	𐞗	452	239	𐞗	477
181	𐞗	412	211	𐞗	455	240	𐞗	477
182	𐞗	418	212	𐞗	459	241	𐞗	477
183	𐞗	421	213	𐞗	459	242	𐞗	478
184	𐞗	421	214	𐞗	459	243	𐞗	479
185	𐞗	422	215	𐞗	459	244	𐞗	480
186	𐞗	423	216	𐞗	459	245	𐞗	480
187	𐞗	424	217	𐞗	460	246	𐞗	480
188	𐞗	424	218	𐞗	460	247	𐞗	481
189	𐞗	425	219	𐞗	461	247b	𐞗	481
190	𐞗	425	220	𐞗	461	248	𐞗	481
191	𐞗	425	221	𐞗	462	249	𐞗	481
192	𐞗	425	222	𐞗	463	250	𐞗	481
193	𐞗	426	223	𐞗	464	251	𐞗	482
194	𐞗	426	224	𐞗	464	252	𐞗	482
195	𐞗	427	225	𐞗	464	253	𐞗	482
196	𐞗	427	226	𐞗	465	254	𐞗	482
197	𐞗	427	227	𐞗	465	255	𐞗	482

西夏文字小字典目次

256	𐄂	485	279	𐄉	493	302	𐄒	499
257	𐄃	486	280	𐄊	493	303	𐄓	499
258	𐄄	486	281	𐄋	493	304	𐄔	500
259	𐄅	486	282	𐄌	493	305	𐄕	500
260	𐄆	487	283	𐄍	493	306	𐄖	501
261	𐄇	488	284	𐄎	493	307	𐄗	501
262	𐄈	488	285	𐄏	493	308	𐄘	501
263	𐄉	489	286	𐄐	494	309	𐄙	501
264	𐄑	489	287	𐄒	494	310	𐄚	501
265	𐄓	489	288	𐄔	494	311	𐄛	501
266	𐄕	489	289	𐄖	494	312	𐄜	502
267	𐄗	489	290	𐄘	495	313	𐄝	502
268	𐄙	489	291	𐄚	495	314	𐄞	502
269	𐄛	489	292	𐄜	495	315	𐄟	502
270	𐄝	491	293	𐄞	495	316	𐄠	503
271	𐄟	491	294	𐄟	495	317	𐄡	503
272	𐄡	491	295	𐄢	495	318	𐄣	503
273	𐄣	491	296	𐄤	496	319	𐄥	503
274	𐄥	491	297	𐄦	496	017b	𐄧	504
275	𐄧	491	298	𐄨	498	017c	𐄩	504
276	𐄩	492	299	𐄪	498	017d	𐄫	504
277	𐄫	492	300	𐄬	499	017e	𐄭	505
278	𐄭	492	301	𐄮	499			