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ISO
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ORGANISATION INTERNATIONALE DE NORMALISATION

ISO/IEC JTC 1/ SC 2/ WG 2
Universal Multiple-Octet Coded Character Set
(U C S)

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Introduction

Upon the resolution M32.9 about Mongolian proposal, China has convened a meeting discussing Mongolian Ad Hoc report N1515 in Inner Mongolia.

The experts accepted the ad hoc report provisionally and prepared another draft with all necessary documents in high quality including the feedback addressing the open issues in N1515. This draft is composed of the following parts:

● Views Expressed During Discussion on "Report of the Ad-Hoc Group on Mongolian Encoding (N1515).

This part presents our analysis and opinions on approach of control characters. This part also address the open issues in N1515 and introduce "Suggestions on Mongolian compulsory ligatures" as well as its relation with Mongolian transliteration covered in ISO/TC46/SC2.

- Coding prevention, code tables and their namelist
- There is an appendix attached "Technical errors found in 'N1515'", which listed all technical and editorial defects in N1515.
- 2 Sample sheet of Mongolian reference table in high quality.

During middle of May 1997 China send a delegation to London for Mongolian transliteration of ISO/TC46/SC2 meeting. Mongolian experts exchanged opinions on Mongolian encoding with the experts from Mongolia, U.K, Ireland and Germany. They are just about to prefer the control character approach in N1510, which was achieved in International Mongolian Encoding Meeting held in August of 1996 in Beijing. China thinks it necessary to discuss again on this seemingly last disagreed part of Mongolian encoding proposal and proposed to hold a Mongolian discussion meeting again in China. China contacted Mongolia and UNU/IIST to have their opinions. Mongolia responded actively and invited China to send a delegation to the World Mongolian Conference in Ulanbaator 12th of August 1997. China has agreed to attend the conference and suggest having a specific meeting on Mongolian encoding.

However China would like to have the experts from UNU/IIST to attend the meeting too, since they are applying for a liaison identity and especially they have different ideas on control approach. Their availability would contribute to the real agreement potentially reached in Mongolia. China has sent several faxes and mails to UNU/IIST, with no reply until I came here.

Under this environment, China did not present the entire Mongolian reference table and the related documents.

China hope to present the final and high quality Mongolian encoding proposal draft after that conference.

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Mongolian Character Encoding Conventions

1. The Mongolian script character set is a coding proposal of Mongolian scripts which includes Mongolian letters, Todo letters, Sibe letters, Manchu letters, Ali Gali (letters used for the transcription of Tibetan and Sanskrit), punctuation marks, digits and control characters. The written languages Todo, Sibe and Manchu all share Mongolian letters.

This proposal only encodes canonical characters. Ligatures which are logically larger than one character unit and graphemes which are logically smaller than one character unit are excluded.

2. The encoding is given in the sequence

- punctuation marks
- digits
- letters.

The letters comprise Mongolian letters, Mongolian Todo letters, Mongolian Sibeletters, Mongolian Manchu letters and Ali Gali letters.

Many Mongolian, Todo, Sibe and Manchu characters have different forms according to their position in the word (initial, medial or final). Due to additional variation, there can be more than ten presentation form variants for a given letter.

According to the relevant principles of ISO/IEC 10646, only one of those presentation forms is to be encoded. This form is named "basic character". For the vowels, their isolated forms are adopted. As a rule, only the presentation form appearing before the vowel "A" is adopted for the consonants. All other forms are classified as "presentation forms". Some characters of different scripts have the same shape as the canonical character or the initial form but different shapes when being used in medial or final position. As an exception to the previous rule, in order to differentiate between the character in different scripts, different forms are adopted as basic characters. For example, the middle form of the character ANG in Mongolian, Todo, Sibe and Manchu is ᠠᠩ, its final form is ᠠᠩᠭ in Mongolian, ᠠᠩᠭ in Todo, ᠠᠩᠭ in Sibe and ᠠᠩᠭ in Manchu (as in Mongolian). In order to emphasize this difference, the medial form ᠠᠩ is chosen as basic character for Mongolian and Manchu, the final form ᠠᠩᠭ is chosen for To-

do and the final form ᠨ is chosen for Sibe. This exceptional treatment covers the following Todo, Sibe and Manchu letters:

ᠨ (TODO BA), ᠮ (TODO MA), ᠮ (TODO TSA), ᠮ (TODO YA), ᠮ (TODO HAA); ᠮ (SIBE E), ᠮ (SIBE I), ᠮ (SIBE U), ᠮ (SIBE KA), ᠮ (SIBE TA), ᠮ (SIBE DA), ᠮ (SIBE JA); ᠮ (MANGHUI), ᠮ (MANCHU KA), ᠮ (MANCHU RA), ᠮ (MANCHU FA).

3. Four characters require special treatment. The two Mongolian character pairs O and U as well as OE and UE have almost the same shape both as basic characters and in their presentation forms. However, in Mongolian, these four characters are independent and have different meanings despite their identical form. For example, ᠪᠣᠳᠣ (BODO) means "think", ᠪᠣᠳᠤ (BUDU) means "dye", ᠣᠡᠭᠡᠯᠡᠬᠡ (OEGELEHUE) means "trim" and ᠤᠡᠭᠡᠯᠡᠬᠡ (UEGELEHUE) means "appeal". These words are distinguished by the difference of the four vowels O, U, OE, and UE. Thus, in the Basic Character Set, the four vowels are encoded as ᠣ (isolated form of O), ᠤ (initial form of U), ᠣᠡ (isolated form of OE), and ᠤᠡ (initial form of UE). In this way, the problems specific to Mongolian vowels are settled and accordance with ISO/IEC 10646 is achieved.

4. The basic characters of Mongolian, Todo, Sibe and Manchu are unified according to their shapes. The names of the unified characters are listed in the order of Mongolian, Todo, Sibe and Manchu; the name of the first representative in this list is taken as the character name. Letters only used in Mongolian and letters commonly used in the other scripts share the common name prefix MONGOLIAN LETTER. The names of letters exclusively used in Todo are prefixed by MONGOLIAN LETTER TODO. The names of letters exclusively used in Sibe are prefixed by MONGOLIAN LETTER SIBE. The names of letters exclusively used in Manchu are prefixed by MONGOLIAN LETTER MANCHU. The Ali Gali letters of Mongolian, Todo and Manchu are prefixed by MONGOLIAN LETTER AG, MONGOLIAN LETTER TODO AG, and MONGOLIAN LETTER MANCHU AG, respectively.

5. The unified forms of the basic characters of the four scripts and their respective name variants are recorded in the "Mongolian Reference Table".

6. The unified basic characters are arranged in the order of Mongolian, Todo, Sibe, Manchu and Ali Gali characters.

7. In the majority of cases, the presentation forms of all four scripts can be determined by their position and other constraints. However, there is a very small number of cases where the proper form cannot be distinguished by word-internal constraints alone. In order to distinguish these, various control characters are used. Their use is explained in the text accompanying the Mongolian Reference Table.

8. The presentation form set of Mongolian, Todo, Sibe, and Manchu as well as Ali Gali is listed in the separate Mongolian Reference Table.

Mongolian Basic Character Set

	00	01	02	03	04	05	06	07
0	᠎	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	000	016	032	048	064	080	096	112
1	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	001	017	033	049	065	081	097	113
2	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	002	018	034	050	066	082	098	114
3	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	003	019	035	051	067	083	099	115
4	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	004	020	036	052	068	084	100	116
5	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	005	021	037	053	069	085	101	117
6	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	006	022	038	054	070	086	102	118
7	᠋	᠋	᠋	᠋	᠋	᠋	᠋	᠋
	007	023	039	055	071	087	103	119
8	᠋	᠋	᠋	᠋	᠋	᠋	᠋	
	008	024	040	056	072	088	104	120
9	᠋	᠋	᠋	᠋	᠋	᠋	᠋	
	009	025	041	057	073	089	105	121
A	᠋		᠋	᠋	᠋	᠋	᠋	
	010	026	042	058	074	090	106	122
B	᠋		᠋	᠋	᠋	᠋	᠋	
	011	027	043	059	075	091	107	123
C			᠋	᠋	᠋	᠋	᠋	
	012	028	044	060	076	092	108	124
D			᠋	᠋	᠋	᠋	᠋	
	013	029	045	061	077	093	109	125
E			᠋	᠋	᠋	᠋	᠋	
	014	030	046	062	078	094	110	126
F			᠋	᠋	᠋	᠋	᠋	
	015	031	047	063	079	095	111	127

Views Expressed During Discussion on "Report of the Ad-Hoc Group on Mongolian Encoding" (N 1515)

The Mongolian Encoding Group of China held a special meeting in March, 1997, during which our scholars discussed in detail the "Report of the Ad-Hoc Group on Mongolian Encoding" (N 1515), result of the Singapore Conference of ISO/ IEC/ JTC/ SC 2/ WG2. Generally speaking, "N 1515" is a rather good proposal that has incorporated the merits of various proposals formerly submitted. However, there still exist a few technical errors that should be improved as well as a few other problems that require further consideration.

We agree to accept this report as basis for further research, revision and perfection of the proposal.

We agree to "Mongolian Encoding Character Conventions" and "Names of Mongolian Basic Character Set" of the report.

Certain graphic symbols in "Mongolian Basic Character Set" ought to be modified (See our "Mongolian Basic Character Set").

Quite a number of items in "Mongolian Reference Table" of "N 1515" require further consideration. For concrete views please see the "Mongolian Reference Table" we submit.

For certain technical errors in "N 1515" that require correction, please see our "Technical Errors Found in N 1515".

Here we make the following suggestions for further discussion of "N 1515":

1. Mongolian space : We do not agree to the non-breaking space (NBSP) in10646. Because the NBSP and the Mongolian space have deferent natures and deferent usages, so it can not be accepted.

2. Control characters: Because of the characteristics of the written Mongolian language, the use of control characters is unavoidable. Control characters can be divided in terms of functions under three groups, as ① Variant Selectors; ② Character Separators and ③ Ligature Symbols respectively.

Roughly speaking, there are two kinds of variant selectors: one is used in writing "complete words"; the other in writing "variant presentation forms" not within a word. The first kind of variant selectors appear highly frequently (Statistics shows that of one million words in linguistic material they appear altogether 117410 times, or 11.74%), but they do not require many variant selectors—two would be enough if we accept the method in "N 1515". The second kind of variant selectors appear at a very low frequency (Statistics shows that they appear 1803 times in a single reading primer, or 0.18% of the one million words of the linguistic material), but they require many variant selectors, at least ten if they are placed after characters as is shown in "N 1515". In view of the above, we suggest that in formulating variant selectors, the former kind should be taken into greater consideration.

It is true that the way variant selectors are used as indicated in "N 1515" facilitates the writing of variant presentation forms not within words, especially when we are considering the difficulty in computer processing. However, more variant selectors will be needed in writing "complete words", which will cause clients trouble to find their recording rules.

On the other hand, though the use of variant selectors as put forward by "N 1510" seems complicated and the clients have to look for rules for their encoding, yet in writing complete words, the clients need fewer variant selectors and it is easier for them to remember them.

Besides, we suggest to preserve a word separator \square and a ligature selector, \square for the time being because a definite view has not been agreed upon.

A word separator is used to separate a single word while preserving its joined shape, e. g. , \square (Gone), \square (Industry) which are composed of \square + \square . They should be inputted as \square \square and \square \square .

golian Syllable Set” of our proposal.)

② Every compulsory ligature in Mongolian contains two letters, and there exists only one method to input or output it on the computer. For example, the final \mathfrak{D} \mathfrak{Z} can be inputted only as \mathfrak{P} and the initial \mathfrak{D} \mathfrak{Z} are connected only as \mathfrak{P} .

③ A ligature can be formed in more than one way, thus, the “Entire Syllable Method” (which requires 194 characters); the “Horizontal Cutting Method” (for which 50-60 characters are needed) and the “Vertical Cutting Method” (20-30 characters are required). At present views vary.

④ It's good if uniformity is reached in the future through consultations, but there is no need to impose it upon everybody. Since there is only one way either to input or to output a ligature, it does not seem necessary that only one method be adopted to connect two letters into a ligature.

⑤ In view of the above, for the present we do not list in “Mongolian Reference Table” varied presentation forms related to compulsory ligatures.

5. Suggestion regarding “Possible Ligatures in Mongolian”.

① In order to meet the needs in certain precision printing, we suggest to add some “possible ligatures” to varied presentation forms, e. g. , \mathfrak{D} \mathfrak{Z} \mathfrak{S} \mathfrak{P} , etc. The number of such possible ligatures can be agreed upon through consultations.

② We can use the ligature selector to mark a possible ligature being used, e. g. , \mathfrak{D} , \mathfrak{Z} , \mathfrak{S} , and \mathfrak{P} can be marked as $\mathfrak{D} \rightarrow \square$, $\mathfrak{Z} \rightarrow \square$, $\mathfrak{S} \rightarrow \square$ and $\mathfrak{P} \rightarrow \square$ respectively.

6. Suggestion as to dovetail the Mongolian encoding and the Transliteration of Mongolian Characters in Latin Characters.

① The problem as to how to dovetail Mongolian encoding system and the Transliteration of Mongolian Characters in Latin Characters is mentioned both in the Proceedings of the 17th Conference of ISO/TC 46/SC 2 in Oslo in May, 1996 as well as in Mr John Clews' thesis . on our part, we also clearly raised the problem in our Proposal for the Transliteration of Mongolian Characters in Latin Characters submitted to ISO/TC 46/SC 2. It seems that all sides concerned

have reached a common understanding of this problem .

② In view of the above, we propose:

▲ To use -(Nirugu) to mark the initial π , π , π and π of the second root of a double-root word in complete words. Thus, π in π can be inputted as π , and π , π , π are marked as π , π , and π . If so, international practice will easily transliterate them into “buyan-arbi” and “-i, -u, -o”. On the other hand, however, if π MC5 , π MC3 , π MC3 and π MC4 are used as indicated in “N 1515”, then we will face two difficulties in transliterating MC5 , MVC3 and MC4 , i. e. , ① we are in fact transliterating different variant presentation forms into one and the same transliteration symbol; and ② we have to take unnecessary trouble to shift the variant selector after a vowel to a place before the vowel for transliterating so as to conform to international practice.

The combination of a final separate vowel with a consonant preceding it, like “ π (syllable NA), π (syllable QA), π (syllable GA), π (syllable ME), π (syllable LA), π (syllable SA), π (syllable SHE), π (syllable JA), π (syllable YE), π (syllable RE), π (syllable WA), etc. , can each be marked by a variant selector after the vowel, e. g. , is marked π MC8 , π as π MC4 , as π MC8 and so on. We can also mark them with a variant selector after the consonant, e. g. , π is marked as π MC8 π , π as MC8 π and π as π MC4 π . So far as computer coding is concerned, we mustn't say that one method is better than the other. But when we are trying to dovetail our method and “Transliteration of Mongolian Characters in Latin Characters”, it becomes evident that it's better to place the variant selector after the consonant, because in that case these syllables can be easily transliterated into n.a, q.a, g.a, m.e, l.a, s.a, sh.e, j.a, y.e, r.e and w.a.

The Chines delegation

97:04:15

	08	09	0A	0B	0C	0D	0E	0F
0	୦ 128	୧ 144	୧. 160	176	192	208	224	240
1	୦୦ 129	୧ 145	୧୦ 161	177	193	209	225	241
2	୩ 130	୨ 146	୧୫ 162	178	194	210	226	242
3	୩ 131	୨ 147	୧ 163	179	195	211	227	243
4	୩ 132	୧୫ 148	୧୦ 164	180	196	212	228	244
5	୩୦ 133	୧୫ 149	୧୦ 165	181	197	213	229	245
6	୩୩୩ 134	୧୫ 150	୧ 166	182	198	214	230	246
7	୩ 135	୧୫ 151	୧୫ 167	183	199	215	231	247
8	୩ 136	୧୫ 152	୧୦ 168	184	200	216	232	248
9	୩ 137	୧୫ 153	୧୦ 169	185	201	217	233	249
A	୩ 138	୧୫ 154	170	186	202	218	234	250
B	୩ 139	୧୫ 155	171	187	203	219	235	251
C	୩ 140	୧୫ 156	172	188	204	220	236	252
D	୩ 141	୧୫ 157	173	189	205	221	237	253
E	୩ 142	୧୫ 158	174	190	206	222	238	254
F	୩ 143	୧୫ 159	175	191	207	223	239	255

Names of Mongolian Basic Characters

dec	hex	Name
000	00	MONGOLIAN BERGA
001	01	MONGOLIAN ELLIPSIS
002	02	MONGOLIAN COMMA
003	03	MONGOLIAN PERIOD
004	04	MONGOLIAN COLON
005	05	MONGOLIAN FOUR DOTS
006	06	MONGOLIAN COMBINATION SYMBOL
007	07	MONGOLIAN TODO SOFT HYPHEN
008	08	MONGOLIAN SIBE SYLLABLE BOUNDARY MARKER
009	09	MONGOLIAN MANCHU COMMA
010	0A	MONGOLIAN MANCHU PERIOD
011	0B	MONGOLIAN NIRUGU
012	0C	(THIS POSITION SHALL NOT BE USED)
013	0D	(THIS POSITION SHALL NOT BE USED)
014	0E	(THIS POSITION SHALL NOT BE USED)
015	0F	(THIS POSITION SHALL NOT BE USED)
016	10	MONGOLIAN DIGIT ZERO
017	11	MONGOLIAN DIGIT ONE
018	12	MONGOLIAN DIGIT TWO
019	13	MONGOLIAN DIGIT THREE
020	14	MONGOLIAN DIGIT FOUR
021	15	MONGOLIAN DIGIT FIVE
022	16	MONGOLIAN DIGIT SIX
023	17	MONGOLIAN DIGIT SEVEN
023	18	MONGOLIAN DIGIT EIGHT
025	19	MONGOLIAN DIGIT NINE
026	1A	(THIS POSITION SHALL NOT BE USED)
027	1B	(THIS POSITION SHALL NOT BE USED)
028	1C	(THIS POSITION SHALL NOT BE USED)
029	1D	(THIS POSITION SHALL NOT BE USED)
030	1E	(THIS POSITION SHALL NOT BE USED)
031	1F	(THIS POSITION SHALL NOT BE USED)
032	20	MONGOLIAN LETTER A
033	21	MONGOLIAN LETTER E
034	22	MONGOLIAN LETTER I
305	23	MONGOLIAN LETTER O
036	24	MONGOLIAN LETTER U
037	25	MONGOLIAN LETTER OE
038	26	MONGOLIAN LETTER UE
039	27	MONGOLIAN LETTER EE
040	28	MONGOLIAN LETTER NA
041	29	MONGOLIAN LETTER ANG
042	2A	MONGOLIAN LETTER BA
043	2B	MONGOLIAN LETTER PA
044	2C	MONGOLIAN LETTER QA
045	2D	MONGOLIAN LETTER GA
046	2E	MONGOLIAN LETTER MA
047	2F	MONGOLIAN LETTER LA
048	30	MONGOLIAN LETTER SA
049	31	MONGOLIAN LETTER SHA
050	32	MONGOLIAN LETTER TA
051	33	MONGOLIAN LETTER DA
052	34	MONGOLIAN LETTER CHA
053	35	MONGOLIAN LETTER JA
054	36	MONGOLIAN LETTER YA
055	37	MONGOLIAN LETTER RA
056	38	MONGOLIAN LETTER WA
057	39	MONGOLIAN LETTER FA
058	3A	MONGOLIAN LETTER KA
059	3B	MONGOLIAN LETTER KHA
060	3C	MONGOLIAN LETTER TSA
061	3D	MONGOLIAN LETTER ZA
062	3E	MONGOLIAN LETTER HAA
063	3F	MONGOLIAN LETTER ZRA

dec	hex	Name
064	40	MONGOLIAN LETTER LHA
065	41	MONGOLIAN LETTER ZHI
066	42	MONGOLIAN LETTER CHI
067	43	MONGOLIAN LETTER TODO LONG VOWEL SIGN
068	44	MONGOLIAN LETTER TODO E
069	45	MONGOLIAN LETTER TODO I
070	46	MONGOLIAN LETTER TODO O
071	47	MONGOLIAN LETTER TODO U
072	48	MONGOLIAN LETTER TODO OE
073	49	MONGOLIAN LETTER TODO UE
074	4A	MONGOLIAN LETTER TODO ANG
075	4B	MONGOLIAN LETTER TODO BA
076	4C	MONGOLIAN LETTER TODO PA
077	4D	MONGOLIAN LETTER TODO QA
078	4E	MONGOLIAN LETTER TODO GA
079	4F	MONGOLIAN LETTER TODO MA
080	50	MONGOLIAN LETTER TODO TA
081	51	MONGOLIAN LETTER TODO DA
082	52	MONGOLIAN LETTER TODO CHA
083	53	MONGOLIAN LETTER TODO JA
084	54	MONGOLIAN LETTER TODO TSA
085	55	MONGOLIAN LETTER TODO YA
086	56	MONGOLIAN LETTER TODO WA
087	57	MONGOLIAN LETTER TODO KA
088	58	MONGOLIAN LETTER TODO GAA
089	59	MONGOLIAN LETTER TODO HAA
090	5A	MONGOLIAN LETTER TODO JLA
091	5B	MONGOLIAN LETTER TODO NIA
092	5C	MONGOLIAN LETTER TODO DZA
093	5D	MONGOLIAN LETTER SIBE E
094	5E	MONGOLIAN LETTER SIBE I
095	5F	MONGOLIAN LETTER SIBE IY
096	60	MONGOLIAN LETTER SIBE UE
097	61	MONGOLIAN LETTER SIBE U
098	62	MONGOLIAN LETTER SIBE ANG
099	63	MONGOLIAN LETTER SIBE KA
100	64	MONGOLIAN LETTER SIBE GA
101	65	MONGOLIAN LETTER SIBE HA
102	66	MONGOLIAN LETTER SIBE PA
103	67	MONGOLIAN LETTER SIBE SHA
104	68	MONGOLIAN LETTER SIBE TA
105	69	MONGOLIAN LETTER SIBE DA
106	6A	MONGOLIAN LETTER SIBE JA
107	6B	MONGOLIAN LETTER SIBE FA
108	6C	MONGOLIAN LETTER SIBE GAA
109	6D	MONGOLIAN LETTER SIBE HAA
110	6E	MONGOLIAN LETTER SIBE TSA
111	6F	MONGOLIAN LETTER SIBE ZA
112	70	MONGOLIAN LETTER SIBE RAA
113	71	MONGOLIAN LETTER SIBE CHA
114	72	MONGOLIAN LETTER SIBE ZHA
115	73	MONGOLIAN LETTER MANGHU I
116	74	MONGOLIAN LETTER MANGHU KA
117	75	MONGOLIAN LETTER MANGHU RA
118	76	MONGOLIAN LETTER MANGHU FA
119	77	MONGOLIAN LETTER MANGHU ZHA
120	78	(THIS POSITION SHALL NOT BE USED)
121	79	(THIS POSITION SHALL NOT BE USED)
122	7A	(THIS POSITION SHALL NOT BE USED)
123	7B	(THIS POSITION SHALL NOT BE USED)
124	7C	(THIS POSITION SHALL NOT BE USED)
125	7D	(THIS POSITION SHALL NOT BE USED)
126	7E	(THIS POSITION SHALL NOT BE USED)
127	7F	(THIS POSITION SHALL NOT BE USED)

dec	hex	Name
128	80	MONGOLIAN LETTER AG ANUSVARA ONE
129	81	MONGOLIAN LETTER AG VISARGA ONE
130	82	MONGOLIAN LETTER AG DAMARU
131	83	MONGOLIAN LETTER AG UBADAMA
132	84	MONGOLIAN LETTER AG INVERTED UBADAMA
133	85	MONGOLIAN LETTER AG BALUDA
134	86	MONGOLIAN LETTER AG THREE BALUDA
135	87	MONGOLIAN LETTER AG A
136	88	MONGOLIAN LETTER AG I
137	89	MONGOLIAN LETTER AG KA
138	8A	MONGOLIAN LETTER AG NGA
139	8B	MONGOLIAN LETTER AG CA
140	8C	MONGOLIAN LETTER AG TTA
141	8D	MONGOLIAN LETTER AG TTHA
142	8E	MONGOLIAN LETTER AG DDA
143	8F	MONGOLIAN LETTER AG NNA
144	90	MONGOLIAN LETTER AG TA
145	91	MONGOLIAN LETTER AG DA
146	92	MONGOLIAN LETTER AG PA
147	93	MONGOLIAN LETTER AG PHA
148	94	MONGOLIAN LETTER AG SSA
149	95	MONGOLIAN LETTER AG ZHA
150	96	MONGOLIAN LETTER AG ZA
151	97	MONGOLIAN LETTER AG AH
152	98	MONGOLIAN LETTER TODO AG TA
153	99	MONGOLIAN LETTER TODO AG ZHA
154	9A	MONGOLIAN LETTER MANCHU AG GHA
155	9B	MONGOLIAN LETTER MANCHU AG NGA
156	9C	MONGOLIAN LETTER MANCHU AG CA
157	9D	MONGOLIAN LETTER MANCHU AG JHA
158	9E	MONGOLIAN LETTER MANCHU AG TTA
159	9F	MONGOLIAN LETTER MANCHU AG DDHA
160	A0	MONGOLIAN LETTER MANCHU AG TA
161	A1	MONGOLIAN LETTER MANCHU AG DHA
162	A2	MONGOLIAN LETTER MANCHU AG SSA
163	A3	MONGOLIAN LETTER MANCHU AG CYA
164	A4	MONGOLIAN LETTER MANCHU AG ZHA
165	A5	MONGOLIAN LETTER MANCHU AG CA
166	A6	MONGOLIAN LETTER MANCHU AG HALFU
167	A7	MONGOLIAN LETTER TODO AG HALF YA
168	A8	MONGOLIAN LETTER MANCHU AG BHA
169	A9	MONGOLIAN LETTER AG DAGALGA
170	AA	
171	AB	
172	AC	
173	AD	
174	AE	
175	AF	
176	B0	
177	B1	
178	B2	
179	B3	
180	B4	
181	B5	
182	B6	
183	B7	
184	B8	
185	B9	
186	BA	
187	BB	
188	BC	
189	BD	
190	BE	
191	BF	

Mongolian Variant Selector Set

	00	01	02	03	04	05	06	07
0	MVS0 000	016	032	048	064	080	096	112
1	MVS1 001	017	033	049	065	081	097	113
2	MVS2 002	018	034	050	066	082	098	114
3	MVS3 003	019	035	051	067	083	099	115
4	MVS4 004	020	036	052	068	084	100	116
5	MVS5 005	021	037	053	069	085	101	117
6	MVS6 006	022	038	054	070	086	102	118
7	MVS7 007	023	039	055	071	087	103	119
8	MVS8 008	024	040	056	072	088	104	120
9	MVS9 009	025	041	057	073	089	105	121
A	* 010	026	042	058	074	090	106	122
B	U 011	027	043	059	075	091	107	123
C	012	028	044	060	076	092	108	124
D	013	029	045	061	077	093	109	125
E	014	030	046	062	078	094	110	126
F	015	031	047	063	079	095	111	127

Names of Mongolian Variant Selector Set

dec	hex	Name
000	00	MONGOLIAN VARIANT SELECTOR 0
001	01	MONGOLIAN VARIANT SELECTOR 1
002	02	MONGOLIAN VARIANT SELECTOR 2
003	03	MONGOLIAN VARIANT SELECTOR 3
004	04	MONGOLIAN VARIANT SELECTOR 4
005	05	MONGOLIAN VARIANT SELECTOR 5
006	06	MONGOLIAN VARIANT SELECTOR 6
007	07	MONGOLIAN VARIANT SELECTOR 7
008	08	MONGOLIAN VARIANT SELECTOR 8
009	09	MONGOLIAN VARIANT SELECTOR 9
010	0A	MONGOLIAN DISUNITING MARK
011	0B	MONGOLIAN LIGATURE SELECTOR
012	0C	
013	0D	
014	0E	
015	0F	
016	10	
017	11	
018	12	
019	13	
020	14	
021	15	
022	16	
023	17	
023	18	
025	19	
026	1A	
027	1B	
028	1C	
029	1D	
030	1E	
031	1F	
032	20	
033	21	
034	22	
305	23	
036	24	
037	25	
038	26	
039	27	
040	28	
041	29	
042	2A	
043	2B	
044	2C	
045	2D	
046	2E	
047	2F	
048	30	
049	31	
050	32	
051	33	
052	34	
053	35	
054	36	
055	37	
056	38	
057	39	
058	3A	
059	3B	
060	3C	
061	3D	
062	3E	
063	3F	

Technical Errors Found in "N 1515"

1. Several graphic forms in "Mongolian Basic Character Set" have to be corrected:

009 should be	010 should be	058 should be
105 should be	107 should be	118 should be
148 should be	154 should be	162 should be
166 should be	168 should be	

2. A modification in "Mongolian Variant Selector Set":

The abbreviation for the control symbol MC should be changed into MVS so as to conform it to its full name.

3. Changes in "Mongolian Reference Table":

(1) Basic characters:

- ① Apart from those corrections listed in 1, the character No. 051 should be .
- ② All the serial numbers in the Table should consist of three digits (000 – 171) in accordance with those provided in the Basic Set.
- ③ The name of the letter No. 59 should be changed into KHA.

(2) Presentation forms:

① Errors in numbers:

- The number for 39. 2 should be 056.
- The number for 44. 2 should be 137.
- The number for 45. 2 should be 137, too.

② Glyph:

- 0 Its second presentation form should be .
- 34 Its third presentation form (second final form) is one attached from below to round-top characters(, , , etc.), so it should be cancelled.
- 48 Its presentation form 48-3 should be .
- 53 Its presentation form 34-2 should be .
- 54 Its presentation form 34-2 should be .
- 63 Its presentation forms should be and .
- 71 Its presentation forms should be , , , .
- 99-1 should be: .
- 103-2 should be .
- 105 Its presentation forms should be , , .
- 118 Its presentation form should be .
- 160 Its presentation form should be .
- 165 Its presentation form should be .

(3) Unification Table:

- 3 $\dot{=}$ Its PE should be changed into pr.
- 9 \checkmark Its CO should be changed into cm.
- 10 \checkmark Its PE should be changed into pr.
- 132 \times Its DAM should be changed into dm.
- 135 \mathcal{Q} Its BAL should be changed into bl.

(4) Presentation Rule:

In order to present the character itself, the code itself should be added to it.

Thus, the rule for \simeq should be \simeq MVSO ;

the rule for \vdots should be \vdots ;

Because a mere MCO could never present a character.

Mongolian Reference Table

BASIC CHARACTERS			PRESENTATION FORMS			UNIFICATION TABLE				PRESENTATION	
No	CHARACTERS	NAME	No	CLYPH	NAME	M ^①	T ^②	S ^③	MA ^④	RULE	TOTAL NO
000	ᠪ	M.᠖BIRGA				br	br			ᠪ MVSQ	
			1	ᠪ	birga first form	br	br			ᠪ MVS1	000
			2	ᠪ	birga second form	br	br			ᠪ MVS2	001
			3	ᠪ	birga third form	br	br			ᠪ MVS3	002
			4	ᠪ	birga fourth form	br	br			ᠪ MVS4	003
001	᠋	M. ELLIPSIS				el	el	el	el	᠋	
002	᠋	M. COMMA				cm				᠋	
003	᠋	M. PERIOD				pr				᠋	
004	᠋	M. COLON				cl	cl	cl	cl	᠋	
005	᠋	M. FOUR DOTS				fd	fd			᠋	
006	?!	M. COMBINATORY SYMBOL				cs	cs			?! MVSQ	
			1	!?	combinatory symbol alternative form	cs	cs			?! MVS1	004
007	᠋	MT.᠖SOFT HYPHEN					sh			᠋	
008	᠋	MS.᠖SILLABLE BOUNDARY MARKER						sbm		᠋	
009	᠋	MM.᠖COMMA							cm	᠋	
010	᠋	MM. PERIOD							pr	᠋	

- ① M. = MONGOLIAN ⑤ M. = MONGOL
 ② MT. = MONGOLIAN TODO ⑥ T. = TODO
 ③ MS. = MONGOLIAN SIDE ⑦ S. = SIDE
 ④ MM. = MONGOLIAN MANCHU ⑧ MA. = MANCHU

BASIC CHARACTERS			PRESENTATION FORMS			UNIFICATION TABLE				PRESENTATION			
No	CHARACTERS	NAME	No	CLYPH	NAME	M	T	S	MA	RULE	TOTAL NO		
011	•	M. NIRUGU				nr	nr	nr	nr	•			
016	0	MD. 0 ZERO				ze	ze			0			
017	1	MD. ONE				on	on			1			
018	2	MD. TWO				tw	tw			2			
019	3	MD. THREE				th	th			3			
020	4	MD. FOUR				fo	fo			4			
021	5	MD. FIVE				fi	fi			5			
022	6	MD. SIX				si	si			6			
023	7	MD. SEVEN				se	se			7			
024	8	MD. EIGHT				ci	ci			8			
025	9	MD. NINE				ni	ni			9			
032	ᠠ	ML. ᠠ			ml. a first isolate form	a	a	a	a	ᠠ	MVS0		
			033		ml. a second isolate form	a				ᠠ	MVS1		
				1	ᠠ	ml. a initial form	a	a	a	a	ᠠ	MVS2	005
				2	ᠡ	ml. a first medial form	a	a	a	a	ᠡ	MVS4	006
				3	ᠢ	ml. a second medial form	a				ᠢ	MVS3	007
				4	ᠣ	ml. a third medial form	a	a			ᠣ	MVS5	008
				5	ᠤ	ml. a final form	a	a	a	a	ᠤ	MVS6	009
				6	ᠥ	ml. a connected final form	a				ᠥ	MVS7	010
	7	ᠦ	ml. a separate final form	a	a	a	a	ᠦ	MVS8	011			

① MD. = MONGOLIAN DIGIT ② ML. = MONGOLIAN LETTER

BASIC CHARACTERS			PRESENTATION FORMS			UNIFICATION TABLE				PRESENTATION		
No	CHARA - CTERS	NAME	No	CLYPH	NAME	M	T	S	MA	RULE	TOTAL NO	
033	ع	ML. E			ml. e isolate form	e		e	e	ع MVS0		
			032 - 3	ع	ml. e initial form	e		e	e	ع MVS2		
			032 - 2	ع	ml. e medial form	e		e	e	ع MVS4		
			032 - 5	ع	ml. o final form	e				ع MVS5		
			032 - 7	ع	ml. e separate final form	e				ع MVS6		
034	ا	ML. I	—	—	ml. i isolate form	i				ا MVS0		
				1	ا	ml. i initial form	i				ا MVS2	012
			053	ا	ml. i first medial form	i				ا MVS4		
			094	ا	ml. i second medial form	i				ا MVS5		
				2	ا	ml. i final form	i				ا MVS6	013
035	ا	ML. O	—	—	ml. o isolate form	o		o	o	ا MVS0		
			036	ا	ml. o initial form	o		o	o	ا MVS2		
				1	ا	ml. o first medial form	o		o	o	ا MVS3	014
				2	ا	ml. o second medial form	o				ا MVS4	015
				3	ا	ml. o first final form	o		o	o	ا MVS5	016
				4	ا	ml. o second final form	o				ا MVS6	017

BASIC CHARACTERS			PRESENTATION FORMS			UNIFICATION TABLE				PRESENTATION			
No	CHARAC- TERS	NAME	No	CLYPH	NAME	M	T	S	MA	RULE	TOTAL NO		
036	व	ML. U	035	ॠ	ml. u isolate form	u				व	MVS0		
			—	—	ml. u initial form	u				व	MVS2		
			035 - 1	ॡ	ml. u first medial form	u				व	MVS4		
			035 - 2	ॢ	ml. u second medial form	u				व	MVS5		
			035 - 3	ॣ	ml. u final form	u				व	MVS6		
037	वृ	ML. OE	—	—	ml. oe isolate form	oe				वृ	MVS0		
			038	ॠ	ml. oe initial form	oe				वृ	MVS2		
			097	ॡ	ml. oe first medial form	oe				वृ	MVS4		
			035 - 1	ॢ	ml. oe second medial form	oe				वृ	MVS5		
				1	ॣ	ml. oe third medial form	oe				वृ	MVS7	018
			035 - 3	॥	ml. oe first final form	oe				वृ	MVS6		
				2	॥	ml. oe second final form	oe				वृ	MVS8	019
038	व्र	ML. UE	037	ॠ	ml. ue first isolate form	ue				व्र	MVS0		
			073	ॡ	ml. ue second isolate form	ue				व्र	MVS1		
			—	—	ml. ue initial form	ue				व्र	MVS2		
			097	ॢ	ml. ue first medial form	ue				व्र	MVS4		
			035 - 1	ॣ	ml. ue second medial form	ue				व्र	MVS5		
			037 - 1	॥	ml. ue third medial form	ue				व्र	MVS7		
			035 - 3	०	ml. ue first final form	ue				व्र	MVS6		
			037 - 2	१	ml. ue second final form	ue				व्र	MVS8		