ISO/IEC JTC 1/SC 2/WG 2

Universal Multiple-Octet Coded Character Set (UCS) - ISO/IEC 10646

Secretariat: ANSI

Title:	**Proposal on IPA Extensions & Combining Diacritical Marks for ISO/IEC 10646 in BMP**
Source:	**China National Body**
Action:	**To Discuss at WG2 #44**
Distribution:	**SC2/WG2 Experts**

1. Introduction

Since 1970s, 494 phonetic characters and 106 tonetic characters have been used by Chinese linguists and educationalists to inspect language, do research on language, provide knowledge of language and compile different lingual dictionaries. They are also used by Chinese publishers to publish kinds of articles about language researching and teaching. These characters are designed and published by Institute of Linguistics of Chinese Academy of Social Sciences, on the magazine called 'FangYan'. And actually this character set is academic and industrial standard. With the development of digital instruments which are used to process characters, Founder Electronics has provided an electronic publishing system using this character set

There are some international phonetic characters in the IPA Extensions, Combining Diacritical Marks of ISO/IEC 10646, but unfortunately the quantity of these characters is too small to fulfill the requests of lingual research, lingual education and publishing articles. After the whole examination, 320 phonetic characters are found lacked. The following demonstrates the 5 class of lacked characters:

    1) 8 single phonetic characters and 2 combining ones.
    2) 9 combining latin small letter above right or below.
    3) 65 combining diacritical marks.
    4) 236 tonetic marks.

In the era of information, the lack of phonetic characters has great effect on not

only publishing but also data transfer and database management of different languages. As the consequence, the supplement and consummating of current international phonetic character set is very imminent.

2. Background of the proposal

In 1979, by referring to the phonetic character standards published by International Phonetic Association and widely collecting phonetic characters which are used or used to be used by international linguists and publishers, 'Fangyan' magazine office designed a set of new international phonetic characters. In the recent years, Institute of Linguistics of Chinese Academy of Social Sciences has called several expert meetings in order to solve problems on the specification of international phonetic character figures and quantities. These meetings successfully established the code specification of extension international phonetic characters based on the original 494 phonetic characters and 106 tonetic characters published by 'Fangyan' magazine. And these meetings also help the recommendation of appending international phonetic characters and extension characters on the BMP of ISO/IEC 10646 to come into being.

3. Principle

1) International phonetic characters are the appending of IPA Extensions, Combining Diacritical Marks defined in ISO/IEC 10646.
2) International phonetic characters could express and exchange all the information in international phonetic character, and fulfill the requests of Chinese linguists, educationalists and publishers managing information.
3) The order of international phonetic characters should follow the order in the basic set.
4) International phonetic characters are feasible according to the information management technology.

4. Technical facts

1) The order of international phonetic characters follows the order in the basic set.
2) International phonetic characters must follow the principle prescribed by International Phonetic Association (This principle specified the phonetic symbols printing rule and figure feature). And these characters should accord the industrial specifications and technical standards defined by Chinese linguists, educationalists and publishers.
3) All characters in international phonetic character extensions should correspond with codes one by one in order to make international phonetic

characters share the BMP like other characters including Chinese characters. This can realize the standardization of IPA data processing in the world.

5. Conclusion

This character set has been tested iteratively by Chinese lingual, educational and publishing experts. Many linguists, educationalists, publishers and software developers have shown their desire on the world-uniform international phonetic characters so that many difficult problems of lingual research, education, project and information management could be solved. We are sure BMP of ISO/IEC 10646 including the international phonetic character extension set which we apply this time will greatly promote the globalization of IPA data processing.

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646

A. Administrative

1. **Title:**   **IPA Extensions & Combining Diacritical Marks**
2. Requester's name: China
3. Requester type (Member body/Liaison/Individual contribution):   Member body
4. Submission date: 2003-09-27
5. Requester's reference (if applicable):
6. (Choose one of the following:):
          This is a complete proposal:
          or,   More information will be provided later: Yes

B. Technical - General

1. (Choose one of the following:)
          a. This proposal is for a new script (set of characters):   No
                    Proposed name of script:
.   b. The proposal is for addition of character(s) to an existing block: Yes
                    Name of the existing block: IPA Extensions & Combining Diacritical Marks
2. Number of characters in proposal: 320
3. Proposed category (see section II, Character Categories):   A
4. Proposed Level of Implementation (1, 2 or 3) (see clause 14, ISO/IEC 10646-1: 2000):   1
          Is a rationale provided for the choice?   No
          If Yes, reference:
5. Is a repertoire including character names provided?   Yes
          a. If YES, are the names in accordance with the 'character naming guidelines
                    in Annex L of ISO/IEC 10646-1: 2000?   Yes
          b. Are the character shapes attached in a legible form suitable for review?   Yes
6. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for
          publishing the standard?   Institute of Linguistics, Chinese Academy of Social Sciences
          If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools
          used: No.5 Jianguomennei Dajie, Beijing 100732, China
                              Email: fangyan@linguistics.cass.net.cn

7. References:
          a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? Yes (will provide)
          b. Are published examples of use (such as samples from newspapers, magazines, or other sources)
                    of use of proposed characters attached?   Yes (will provide)
8. Special encoding issues:
          Does the proposal address other aspects of character data processing (if applicable) such as input,
          presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?
                                                                                                              No

9. Additional Information:
Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script
that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script.
Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour
information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default
Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization
related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also
see http://www.unicode.org/Public/UNIDATA/UnicodeCharacterDatabase.html and associated Unicode Technical
Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode
Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?   No

      If YES explain_____

2. Has contact been made to members of the user community (for example: National Body,
        user groups of the script or characters, other experts, etc.)?   Yes

        If YES, with whom?_____   National Body

        If YES, available relevant documents? _____ (info will be provided)

3. Information on the user community for the proposed characters (for example:
        size, demographics, information technology use, or publishing use) is included?   Yes

        Reference: _____ (info will be provided)

4. The context of use for the proposed characters (type of use; common or rare)   Common

        Reference: _____ (info will be provided)

5. Are the proposed characters in current use by the user community?   Yes

        If YES, where? Reference: _____   Worldwide

6. After giving due considerations to the principles in *Principles and Procedures document* (a WG 2 standing
        document) must the proposed characters be entirely in the BMP?   Yes

        If YES, is a rationale provided?   _____

        If YES, reference: _____

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?   No

8. Can any of the proposed characters be considered a presentation form of an existing
        character or character sequence?   No

        If YES, is a rationale for its inclusion provided?   _____

        If YES, reference: _____

9. Can any of the proposed characters be encoded using a composed character sequence of either
        existing characters or other proposed characters?   No

        If YES, is a rationale for its inclusion provided?   _____

        If YES, reference: _____

10. Can any of the proposed character(s) be considered to be similar (in appearance
        or function) to an existing character?   No

        If YES, is a rationale for its inclusion provided?   _____

        If YES, reference: _____

11. Does the proposal include use of combining characters and/or use of composite sequences
        (see clauses 4.12 and 4.14 in ISO/IEC 10646-1: 2000)?   No

        If YES, is a rationale for such use provided?   _____

        If YES, reference: _____

        Is a list of composite sequences and their corresponding glyph images (graphic symbols)
        provided?   _____

        If YES, reference: _____

12. Does the proposal contain characters with any special properties such as
        control function or similar semantics?   No

        If YES, describe in detail (include attachment if necessary)   _____

13. Does the proposal contain any Ideographic compatibility character(s)?   No

        If YES, is the equivalent corresponding unified ideographic character(s) identified? _____

        If YES, reference: _____

Table 1 – Row A9: IPA Extensions & Combining Diacritical Marks Character A

	A90	A91	A92	A93	A94	A95	A96	A97
0	ɰ 000	◌ᴵ 016	′◌ 032	◌· 048	◌˥ 064	◌ʮ 080	⊣ 096	⊣↯ 112
1	ɰ 001	◌ʰ 017	′◌ 033	◌. 049	◌‿ 065	◌↷ 081	⊦ 097	⊣↯ 113
2	g 002	◌ʷ 018	‚◌ 034	.◌̂ 050	ˇ◌ 066	◌↶ 082	⊥ 098	⊣↯ 114
3	ɦ 003	◌̄ 019	◌′ 035	•◌ 051	˅◌ 067	◌↓↑ 083	⊥ 099	⊣↯ 115
4	ŋ 004	−◌ 020	◌̀ 036	•◌ 052	◌˯ 068	ɕ◌ 084	◌⌐ 100	⊣↯ 116
5	ʔ 005	◌̠ 021	◌̀ 037	•◌ 053	◌˅ 069	ʢ◌ 085	◌⌐ 101	⊣↯ 117
6	ʊ 006	◌̄ 022	‚◌ 038	•◌ 054	^◌ 070	ˤ◌ 086	◌⌐ 102	⊣↯ 118
7	ɥ 007	◌− 023	◌̀ 039	°◌ 055	⌃◌ 071	ʕ◌ 087	◌⌐ 103	⊣↯ 119
8	tʂ 008	◌= 024	◌̯ 040	°◌ 056	◌̂ 072	◌ˀ 088	◌⊣ 104	◌⌙ 120
9	dʑ 009	◌= 025	◌̀ 041	◌̥ 057	◌⊢ 073	◌ˀ 089	◌⌐ 105	◌⌙ 121
A	◌ⁿ 010	◌̃ 026	◌̀ 042	◌° 058	◌̄ 074	◌ʾ 090	◌⌐ 106	◌⌐ 122
B	◌ˡ 011	◌̰ 027	◌̀ 043	◌̥ 059	◌⊣ 075	◌ʾ 091	◌⊣ 107	◌⌙ 123
C	◌ʷ 012	ˈ◌ 028	◌‘ 044	◌˂ 060	◌⊦ 076	◌̆ 092	◌⌐ 108	◌⌙ 124
D	◌ʲ 013	ˌ◌ 029	◌̒ 045	◌˃ 061	◌⁺ 077	◌̃ 093	◌⌐ 109	◌⌐ 125
E	◌ˠ 014	ˈ◌ 030	◌̈ 046	◌̑ 062	◌⊹ 078	◌̃ 094	⊥ 110	◌⌙ 126
F	◌ˤ 015	ˌ◌ 031	◌̈ 047	◌̆ 063	◌ˣ 079	⊤ 095	⊣↯ 111	◌⌙ 127

Table 2 – Row A9: IPA Extensions & Combining Diacritical Marks Character B

	A98	A99	A9A	A9B	A9C	A9D	A9E	A9F
0	128	144	160	176	192	208	224	240
1	129	145	161	177	193	209	225	241
2	130	146	162	178	194	210	226	242
3	131	147	163	179	195	211	227	243
4	132	148	164	180	196	212	228	244
5	133	149	165	181	197	213	229	245
6	134	150	166	182	198	214	230	246
7	135	151	167	183	199	215	231	247
8	136	152	168	184	200	216	232	248
9	137	153	169	185	201	217	233	249
A	138	154	170	186	202	218	234	250
B	139	155	171	187	203	219	235	251
C	140	156	172	188	204	220	236	252
D	141	157	173	189	205	221	237	253
E	142	158	174	190	206	222	238	254
F	143	159	175	191	207	223	239	255

Table 3 – Row AA: IPA Extensions & Combining Diacritical Marks Character C

	AA0	AA1	AA2	AA3
0	256	272	288	304
1	257	273	289	305
2	258	274	290	306
3	259	275	291	307
4	260	276	292	308
5	261	277	293	309
6	262	278	294	310
7	263	279	295	311
8	264	280	296	312
9	265	281	297	313
A	266	282	298	314
B	267	283	299	315
C	268	284	300	316
D	269	285	301	317
E	270	286	302	318
F	271	287	303	319

Table Row A9-AA: IPA Extensions & Combining Diacritical Marks Character

HEX	NAME
A900	latin small letter l and m
A901	latin small letter turned h with hook
A902	latin small letter feng digraph
A903	latin small letter heng with hook
A904	latin small letter inclined enŋ
A905	latin small letter glottal stop
A906	latin capital letter script u
A907	latin small letter l and turned h with hook digraph
A908	latin small letter t and s with hook digraph
A909	latin small letter d and z with hook digraph
A90A	combining latin small letter n above right
A90B	combining latin small letter l above right
A90C	combining latin small letter w above right
A90D	combining latin small letter j above right
A90E	combining latin small letter gamma above right
A90F	combining latin letter reversed glottal stop above right
A910	combining latin small letter turned r above right
A911	combining latin small letter h above right
A912	combining latin small letter w below
A913	combining line above left
A914	combining line left
A915	combining line below left
A916	combining macron above right
A917	combining line right
A918	combining double line above right
A919	combining double line right
A91A	combining greek perispomeni above right
A91B	greek perispomeni right
A91C	combining vertical line above left
A91D	combining vertical line below left
A91E	combining double line above left
A91F	combining double line below left
A920	combining kerns left circumflex above left
A921	combining kerns left circumflex left
A922	combining kerns left circumflex below left
A923	combining kerns right of circumflex above right
A924	combining kerns right circumflex above left

HEX	NAME
A925	combining kerns right circumflex left
A926	combining kerns right circumflex below left
A927	combining left of circumflex above right
A928	combining left of circumflex below right
A929	combining double grave above left
A92A	combining double grave left
A92B	combining double grave below left
A92C	combining turned comma above right
A92D	combining reversed comma above right
A92E	combining diaeresis above right
A92F	combining colon right
A930	combining dot above right
A931	combining dot below right
A932	combining dot below left
A933	combining dot sub-below left
A934	combining dot left
A935	combining dot sub-above left
A936	combining dot above left
A937	combining ring above left
A938	combining ring left
A939	combining ring below left
A93A	combining ring above right
A93B	combining ring below right
A93C	combining right half ring middle right
A93D	combining left half ring middle right
A93E	combining inverted breve right
A93F	combining breve right
A940	combining left angle above right
A941	combining double inverted breve below
A942	combining caron above left
A943	combining caron left
A944	combining caron below left
A945	combining caron above right
A946	combining circumflex accent above left
A947	combining circumflex accent left
A948	combining circumflex accent below left
A949	combining up tack middle right
A94A	combining down tack middle right

HEX	NAME
A94B	combining left tack middle right
A94C	combining right tack middle right
A94D	combining plus sigh above right
A94E	combining plus sigh right
A94F	combining multiply mark × above right
A950	combining latin letter squat reversed esh above right
A951	Combining rightdown arrow
A952	Combining rightup arrow
A953	combining two arrows right
A954	combining left half ring below left
A955	combining left half ring and a low line below left
A956	combining left half ring above left
A957	combining left half ring and a low line above left
A958	combining right half ring above right
A959	combining right half ring and a low line above right
A95A	combining right half ring below right
A95B	combining right half ring and a low line below right
A95C	combining right dull angle above
A95D	combining left dull angle above
A95E	combining inverted tidle
A95F	five-degree tone value: tone sandhi high level 55
A960	five-degree tone value: tone sandhi sub-high level 44
A961	five-degree tone value: tone sandhi middle level 33
A962	five-degree tone value: tone sandhi sub-low level 22
A963	five-degree tone value: tone sandhi low level 11
A964	five-degree tone value: low rising 12
A965	five-degree tone value: middle rising 13
A966	five-degree tone value: sub-high rising 14
A967	five-degree tone value: high rising 15
A968	five-degree tone value: rising 23
A969	five-degree tone value: rising 24
A96A	five-degree tone value: rising 25
A96B	five-degree tone value: rising 34
A96C	five-degree tone value: high-rising 35
A96D	five-degree tone value: high-rising 45
A96E	five-degree tone value: tone sandhi low-rising 12
A96F	five-degree tone value: tone sandhi rising 13
A970	five-degree tone value: tone sandhi rising 14

HEX	NAME
A971	five-degree tone value: tone sandhi high-rising 15
A972	five-degree tone value: tone sandhi rising 23
A973	five-degree tone value: tone sandhi rising 24
A974	five-degree tone value: tone sandhi rising 25
A975	five-degree tone value: tone sandhi rising 34
A976	five-degree tone value: tone sandhi rising 35
A977	five-degree tone value: tone sandhi rising 45
A978	five-degree tone value: falling 21
A979	five-degree tone value: falling 31
A97A	five-degree tone value: falling 32
A97B	five-degree tone value: falling 41
A97C	five-degree tone value: falling 42
A97D	five-degree tone value: falling 43
A97E	five-degree tone value: falling 51
A97F	five-degree tone value: falling 52
A980	five-degree tone value: falling 53
A981	five-degree tone value: falling 54
A982	five-degree tone value: tone sandhi falling 21
A983	five-degree tone value: tone sandhi falling 31
A984	five-degree tone value: tone sandhi falling 32
A985	five-degree tone value: tone sandhi falling 41
A986	five-degree tone value: tone sandhi falling 42
A987	five-degree tone value: tone sandhi falling 43
A988	five-degree tone value: tone sandhi falling 51
A989	five-degree tone value: tone sandhi falling 52
A98A	five-degree tone value: tone sandhi falling 53
A98B	five-degree tone value: tone sandhi falling 54
A98C	five-degree tone value: falling-rising 212
A98D	five-degree tone value: falling-rising 213
A98E	five-degree tone value: falling-rising 214
A98F	five-degree tone value: falling-rising 215
A990	five-degree tone value: falling-rising 312
A991	five-degree tone value: falling-rising 313
A992	five-degree tone value: falling-rising 314
A993	five-degree tone value: falling-rising 315
A994	five-degree tone value: falling-rising 323
A995	five-degree tone value: falling-rising 324
A996	five-degree tone value: falling-rising 325

HEX	NAME
A997	five-degree tone value: falling-rising 412
A998	five-degree tone value: falling-rising 413
A999	five-degree tone value: falling-rising 414
A99A	five-degree tone value: falling-rising 415
A99B	five-degree tone value: falling-rising 423
A99C	five-degree tone value: falling-rising 424
A99D	five-degree tone value: falling-rising 425
A99E	five-degree tone value: falling-rising 434
A99F	five-degree tone value: falling-rising 435
A9A0	five-degree tone value: falling-rising 512
A9A1	five-degree tone value: falling-rising 513
A9A2	five-degree tone value: falling-rising 514
A9A3	five-degree tone value: falling-rising 515
A9A4	five-degree tone value: falling-rising 523
A9A5	five-degree tone value: falling-rising 524
A9A6	five-degree tone value: falling-rising 525
A9A7	five-degree tone value: falling-rising 534
A9A8	five-degree tone value: falling-rising 535
A9A9	five-degree tone value: falling-rising 545
A9AA	five-degree tone value: tone sandhi falling-rising 212
A9AB	five-degree tone value: tone sandhi falling-rising 213
A9AC	five-degree tone value: tone sandhi falling-rising 214
A9AD	five-degree tone value: tone sandhi falling-rising 215
A9AE	five-degree tone value: tone sandhi falling-rising 312
A9AF	five-degree tone value: tone sandhi falling-rising 313
A9B0	five-degree tone value: tone sandhi falling-rising 314
A9B1	five-degree tone value: tone sandhi falling-rising 315
A9B2	five-degree tone value: tone sandhi falling-rising 323
A9B3	five-degree tone value: tone sandhi falling-rising 324
A9B4	five-degree tone value: tone sandhi falling-rising 325
A9B5	five-degree tone value: tone sandhi falling-rising 412
A9B6	five-degree tone value: tone sandhi falling-rising 413
A9B7	five-degree tone value: tone sandhi falling-rising 414
A9B8	five-degree tone value: tone sandhi falling-rising 415
A9B9	five-degree tone value: tone sandhi falling-rising 423
A9BA	five-degree tone value: tone sandhi falling-rising 424
A9BB	five-degree tone value: tone sandhi falling-rising 425
A9BC	five-degree tone value: tone sandhi falling-rising 434

HEX	NAME
A9BD	five-degree tone value: tone sandhi falling-rising 435
A9BE	five-degree tone value: tone sandhi falling-rising 512
A9BF	five-degree tone value: tone sandhi falling-rising 513
A9C0	five-degree tone value: tone sandhi falling-rising 514
A9C1	five-degree tone value: tone sandhi falling-rising 515
A9C2	five-degree tone value: tone sandhi falling-rising 523
A9C3	five-degree tone value: tone sandhi falling-rising 524
A9C4	five-degree tone value: tone sandhi falling-rising 525
A9C5	five-degree tone value: tone sandhi falling-rising 534
A9C6	five-degree tone value: tone sandhi falling-rising 535
A9C7	five-degree tone value: tone sandhi falling-rising 545
A9C8	five-degree tone value: rising-falling 121
A9C9	five-degree tone value: rising-falling 131
A9CA	five-degree tone value: rising-falling 141
A9CB	five-degree tone value: rising-falling 151
A9CC	five-degree tone value: rising-falling 132
A9CD	five-degree tone value: rising-falling 142
A9CE	five-degree tone value: rising-falling 152
A9CF	five-degree tone value: rising-falling 143
A9D0	five-degree tone value: rising-falling 153
A9D1	five-degree tone value: rising-falling 154
A9D2	five-degree tone value: rising-falling 231
A9D3	five-degree tone value: rising-falling 241
A9D4	five-degree tone value: rising-falling 251
A9D5	five-degree tone value: rising-falling 232
A9D6	five-degree tone value: rising-falling 242
A9D7	five-degree tone value: rising-falling 252
A9D8	five-degree tone value: rising-falling 243
A9D9	five-degree tone value: rising-falling 253
A9DA	five-degree tone value: rising-falling 254
A9DB	five-degree tone value: rising-falling 341
A9DC	five-degree tone value: rising-falling 351
A9DD	five-degree tone value: rising-falling 342
A9DE	five-degree tone value: rising-falling 352
A9DF	five-degree tone value: rising-falling 343
A9E0	five-degree tone value: rising-falling 353
A9E1	five-degree tone value: rising-falling 354
A9E2	five-degree tone value: rising-falling 451

HEX	NAME
A9E3	five-degree tone value: rising-falling 452
A9E4	five-degree tone value: rising-falling 453
A9E5	five-degree tone value: rising-falling 454
A9E6	five-degree tone value: tone sandhi rising-falling 121
A9E7	five-degree tone value: tone sandhi rising-falling 131
A9E8	five-degree tone value: tone sandhi rising-falling 141
A9E9	five-degree tone value: tone sandhi rising-falling 151
A9EA	five-degree tone value: tone sandhi rising-falling 132
A9EB	five-degree tone value: tone sandhi rising-falling 142
A9EC	five-degree tone value: tone sandhi rising-falling 152
A9ED	five-degree tone value: tone sandhi rising-falling 143
A9EE	five-degree tone value: tone sandhi rising-falling 153
A9EF	five-degree tone value: tone sandhi rising-falling 154
A9F0	five-degree tone value: tone sandhi rising-falling 231
A9F1	five-degree tone value: tone sandhi rising-falling 241
A9F2	five-degree tone value: tone sandhi rising-falling 251
A9F3	five-degree tone value: tone sandhi rising-falling 232
A9F4	five-degree tone value: tone sandhi rising-falling 242
A9F5	five-degree tone value: tone sandhi rising-falling 252
A9F6	five-degree tone value: tone sandhi rising-falling 243
A9F7	five-degree tone value: tone sandhi rising-falling 253
A9F8	five-degree tone value: tone sandhi rising-falling 254
A9F9	five-degree tone value: tone sandhi rising-falling 341
A9FA	five-degree tone value: tone sandhi rising-falling 351
A9FB	five-degree tone value: tone sandhi rising-falling 342
A9FC	five-degree tone value: tone sandhi rising-falling 352
A9FD	five-degree tone value: tone sandhi rising-falling 343
A9FE	five-degree tone value: tone sandhi rising-falling 353
A9FF	five-degree tone value: tone sandhi rising-falling 354
AA00	five-degree tone value: tone sandhi rising-falling 451
AA01	five-degree tone value: tone sandhi rising-falling 452
AA02	five-degree tone value: tone sandhi rising-falling 453
AA03	five-degree tone value: tone sandhi rising-falling 454
AA04	five-degree tone value: short high-level 5
AA05	five-degree tone value: short sub-high-level 4
AA06	five-degree tone value: short middle 3
AA07	five-degree tone value: short sub-low level 2
AA08	five-degree tone value: short low level 1

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AA09	five-degree tone value: tone sandhi short high-level 5
AA0A	five-degree tone value: tone sandhi short high-level 4
AA0B	five-degree tone value: tone sandhi short middle level 3
AA0C	five-degree tone value: tone sandhi short sub- low level 5
AA0D	five-degree tone value: tone sandhi short low level 5
AA0E	five-degree tone value: short rising 12
AA0F	five-degree tone value: short rising 13
AA10	five-degree tone value: short rising 14
AA11	five-degree tone value: short rising 15
AA12	five-degree tone value: short rising 23
AA13	five-degree tone value: short rising 24
AA14	five-degree tone value: short rising 25
AA15	five-degree tone value: short rising 34
AA16	five-degree tone value: short rising 35
AA17	five-degree tone value: short rising 45
AA18	five-degree tone value: short rising 34
AA19	five-degree tone value: tone sandhi short rising 13
AA1A	five-degree tone value: tone sandhi short rising 14
AA1B	five-degree tone value: tone sandhi short rising 15
AA1C	five-degree tone value: tone sandhi short rising 23
AA1D	five-degree tone value: tone sandhi short rising 24
AA1E	five-degree tone value: tone sandhi short rising 25
AA1F	five-degree tone value: tone sandhi short rising 34
AA20	five-degree tone value: tone sandhi short rising 35
AA21	five-degree tone value: tone sandhi short rising 45
AA22	five-degree tone value: short falling 21
AA23	five-degree tone value: short falling 31
AA24	five-degree tone value: short falling 32
AA25	five-degree tone value: short falling 41
AA26	five-degree tone value: short falling 42
AA27	five-degree tone value: short falling 43
AA28	five-degree tone value: short falling 51
AA29	five-degree tone value: short falling 52
AA2A	five-degree tone value: short falling 53
AA2B	five-degree tone value: short falling 54
AA2C	five-degree tone value: tone sandhi short falling 21
AA2D	five-degree tone value: tone sandhi short falling 31
AA2E	five-degree tone value: tone sandhi short falling 32

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AA2F	five-degree tone value: tone sandhi short falling 41
AA30	five-degree tone value: tone sandhi short falling 42
AA31	five-degree tone value: tone sandhi short falling 43
AA32	five-degree tone value: tone sandhi short falling 51
AA33	five-degree tone value: tone sandhi short falling 52
AA34	five-degree tone value: tone sandhi short falling 53
AA35	five-degree tone value: tone sandhi short falling 54
AA36	five-degree tone value: neutral tone dot 1
AA37	five-degree tone value: neutral tone dot 2
AA38	five-degree tone value: neutral tone dot 3
AA39	five-degree tone value: neutral tone dot 4
AA3A	five-degree tone value: neutral tone dot 5
AA3B	five-degree tone value: tone sandhi: neutral tone dot 1
AA3C	five-degree tone value: tone sandhi: neutral tone dot 2
AA3D	five-degree tone value: tone sandhi: neutral tone dot 3
AA3E	five-degree tone value: tone sandhi: neutral tone dot 4
AA3F	five-degree tone value: tone sandhi: neutral tone dot 5