Universal Multiple-Octet Coded Character Set

UCS

ISO/IEC JTC1/SC2/WG2 IRGN 2430 R

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Title:	**Submission of Macao's Vertical Extension (UNC Characters), Horizontal Extension, and IVSes Registration for MSCS**
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This is a revised document of IRGN2430 based on the feedback given by IRG editors through circulation (deadline 19 June 2020). The revision is on the handling of MC-00135 which was originally requested by MSARG for vertical extension as an UNC character. Based on all comments given by IRG editors, MSARG agrees to remove MC-00135 from UNC (based on UCV #337 without exceptions) and to submit the character for IVS registration. Due to the coding structure of MSCS, MC-00135 will be made obsolete, and it will be given a new MSCS source reference as ME-8B67-001, where "8B67" is the hexadecimal code of the base character in ISO/IEC 10646 and "001" indicates that this is the first IVS for this base character in MSCS. All revisions to IRGN2430 given below are highlighted for easy reading. Corresponding data files are also revised to reflect the decision of IRG and MSARG's acceptance of this decision.

1 Summary of Request

Macao Special Administrative Region Government (MSARG) is in the process of establishing Macao SAR Information Systems Chinese Character Encoding Scheme

(hereinafter referred to as the "Scheme"). The Scheme sets up the exchange framework to define characters used in Macao for information processing and exchange. To address the issue of Macao specific characters, the Scheme includes a Macao Supplementary Character Set, abbreviated as MSCS. MSARG is planning to publish the Scheme as well as MSCS in 2020 and named the first version of MSCS as MSCS-2020. MSCS-2020 will be used as the information exchange encoding standard among all departments of MSARG first and made publically available for Macao use.

To be aligned with ISO/IEC 10646 for computer processing, MSCS needs to request to IRG/WG2 for (1) vertical extension of 5 characters as UNC submission; (2) horizontal extension of 255 Chinese characters ~~and 16 symbols~~; and (3) new IVSes registration of 68 variants as well as 65 base characters. Details of these requests will be explained in later sections. The checking of these characters has included all published versions of ISO/IEC 10646 including Extension G (Unicode 13.0 Code Chart) as well as IRG Working Set 2017 v5.0 (IRGN2423). Due to COVID-2019, our proposal cannot be presented in a meeting. However, due to its urgency, we appreciate IRG experts to provide review and support especially the UNC submissions to be processed quickly.

2 Introduction of the Scheme

2.1 Character Sets and Source References of the Scheme

The Scheme includes the use of three character sets as a collection for information exchange in Macao: (1) the Big-5 character set; (2) Hong Kong Supplementary Character Set (HKSCS) - 2008; (3) Macao Supplementary Character Set (MSCS). The Big-5 character set has been used in Macao since Macao uses the traditional Chinese system. Due to the close connection with Hong Kong SAR, HKSCS characters are also commonly used in Macao and thus should be supported. MSCS will directly use the encoding framework of ISO/IEC 10646.

In the current ISO/IEC 10646 international encoding standard, the source references of all ideographs submitted by MSARG are "MAC-*nnnnn*", in which "nnnnn" is an MSARG-assigned source reference code between 00001 and 99999. Now MSARG establishes a new set of source references for the Scheme. Under the ISO/IEC 10646 international encoding standard, the source references of the Scheme are as follows:

(1) MB-*hhhh* is used to refer to all characters in the Big-5 character set, in which "hhhh" is the hexadecimal Big-5 code. MB0-*hhhh*, MB1-*hhhh*, and MB2-*hhhh* denote symbols, frequently-used ideographs, and less–frequently-used ideographs, respectively, in terms of how they are referenced in ISO/IEC 10646.

(2) MA-*hhhh* is used to refer to all characters already encoded in HKSCS-2008, in which "hhhh" is the corresponding hexadecimal Big-5 code in HKSCS-2008. HKSCS-2008 is the last version of the HKSCS that was published with Big-5 code points.
(3) MC-*nnnnn* is used for characters vertically extended to ISO/IEC 10646, in which "nnnnn" is an MSCS-assigned source reference code between 00001 and 99999, and assigned in sequence.
(4) MD-*hhhh[h]* is used for characters horizontally extended to ISO/IEC 10646, in which "hhhh[h]" is the four- or five-digit hexadecimal code of the character in the ISO/IEC 10646 international standard. For characters in the Basic Multilingual Plane (BMP or Plane 0), four hexadecimal digits are used. For characters in other planes, five hexadecimal digits are used. HKSCS-2016, the latest version of HKSCS, includes 23 ideographs and one symbol horizontally extended to ISO/IEC 10646. Since MSCS also needs to horizontally extend these characters, MDH-*hhhh[h]* is used as the source reference for these characters to differentiate them from other horizontally-extended characters proposed by MSARG.
(5) ME-*hhhh[h]-nnn* is used for character variants with registered IVSes, in which "hhhh[h]" is the four- or five-digit hexadecimal code of the base character in ISO/IEC 10646, and "nnn" is an MSCS-assigned number between 001 and 999. For variants that share the same base character, "nnn" is assigned in sequence.

MSCS includes the following three parts: 1) MSARG's Vertical Extension to ISO/IEC 10646 (source reference: MC-*nnnnn*); 2) MSARG's Horizontal Extension to ISO/IEC 10646 (source reference: MA-*hhhh,* MB-*hhhh*, MD-*hhhh[h]*); and 3) Macao's variants with registered IVSes (source reference: ME-*hhhh[h]-nnn*).

In principle, MSARG only maintains the glyphs and provides fonts for characters in MSCS and does not maintain the glyphs of the characters in Big-5 and HKSCS as a whole. For characters in Big-5 and HKSCS, MSARG will use the fonts in current computer systems. However, for IVSes registration of variants, both variants and the corresponding base characters should be registered. In fact, MSARG also needs to maintain and provide the glyphs of the base characters in Big-5 and HKSCS for IVSes registration. Therefore, MSARG submits the respective base characters in Big-5 and HKSCS in MSCS for IVS registration as horizontal extension to ISO/IEC 10646.

2.2 MSCS-2020

MSARG is finalizing MSCS-2020, which is planned to be published in 2020 as a part of the Scheme.

MSCS-2020 contains 442 characters, including 426 Chinese characters and 16 symbols. The summary of MSCS-2020 is given as follows:

SN	Current Status	Source Reference	Number		Remarks
			Chinese Character	Symbol	
1	New vertical extension (UNC characters)	MC-*nnnnn*	5		This submission
2	Already vertically extended to ISO/IEC 10646, but the glyphs and source references need to be updated	Change MAC-*nnnnn* to MC-*nnnnn*	86		
3	Horizontal extension of MD (including MDH) Chinese characters	MD-*hhhh[h]* MDH-*hhhh[h]*	196		This submission
4	Horizontal extension of MA and MB base characters	MA-*hhhh* MB-*hhhh*	59		This submission
5	Already horizontally extended to ISO/IEC 10646, but the glyph and source reference need to be updated	Change MAC-*nnnnn* to MD-*hhhh[h]*	1		
6	Symbols in MSCS	MD-*hhhh* MDH-*hhhh*		16	
7	New IVSes to be registered, excluding base characters	ME-*hhhh[h]*-*nnn*	68		This submission
8	IVSes which have been registered in the 2016-08-15 version of the MSARG IVD collection, excluding base characters	ME-*hhhh[h]*-*nnn*	11		
	Total		**426**	**16**	

The complete set of MSCS-2020 is provided in Appendix A.

This submission includes proposed UNC (SN 1), horizontal extension (SN 3 and 4), and IVSes registration (SN 7). Their data is provided in Appendix B, C and D , respectively.

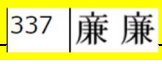
Since standardization will take time, and MSARG will use the ISO/IEC 10646 coding framework, unencoded MSCS characters in ISO/IEC 10646 will temporarily be assigned with PUA (Private Use Area) code points for font production and exchange before they are encoded in ISO/IEC 10646. Based on the use of PUA code points by HKSCS-2008 and major suppliers of system and software, MSCS will use the PUA code points ranging from EEB8 to F12B for font production for the characters not encoded in ISO/IEC 10646 but accepted by MSCS.

3 Submission of Macao's Characters

3.1 Proposed UNC Characters

In MSCS-2020, 5 characters have not been encoded in ISO/IEC 10646 yet. We checked the latest ISO/IEC 10646 standard (including Ext. G in Unicode 13.0 Code Chart) as well as IRG WS 2017 v5.0 (IRGN2423) and found 2 characters (MC-00137 and MC-00139) are included in IRG WS 2017 v5.0 (IRGN2423). These characters and their source references are listed below. Details of their attributes are listed in Appendix B. MSARG would like for the 5 characters to be encoded as UNC characters. If this is acceptable by IRG experts, the two characters in IRG Working Set 2017 v5.0 (both are proposed by UTC) can be removed from IRG Working Set 2017. But, MSARG is willing to accept other solutions if available.

SN	Source Reference	PUA	Macao's Glyph	Remarks
1	MC-00134	U+EEB8	嗻	
~~2~~	~~MC-00135~~	~~U+EEB9~~	譧	~~It has a similar character: U+8B67~~ 8B67 言 149.13 謙 G3-7429 謙 HB2-F4D4 謙 T2-6A22 謙 K2-6157 ~~"廉" (U+4EB7) and "廉" (U+5EC9) are~~

SN	Source Reference	PUA	Macao's Glyph	Remarks
				~~disunified.~~ ~~In UCS Ideograph Unifiable Component Variations List (IRGN2425), most cases of the two components~~  ~~(SN 337) are disunified.~~ ~~Therefore, this character is proposed as UNC. But other suggestions are welcome.~~
2	MC-00136	U+EEBA	琛	
3	MC-00137	U+EEBB	裹	Included in IRG WS 2017 v5.0 (IRGN2423): SN 02004 (GDM-00085, UTC-02993)
4	MC-00138	U+EEBC	旺	The right component is different from “旺” (U+2512E):  In UCS Ideograph Unifiable Component Variations List (IRGN2425), many cases of the components “王” and “壬” (SN 1) are disunified.
5	MC-00139	U+EEBD	塚	Included in IRG WS 2017 v5.0 (IRGN2423): SN 00746 (GDM-00031, UTC-03009)

3.2 Proposed Horizontal Extension

In MSCS-2020, 255 Chinese characters ~~and 16 symbols~~ are to be horizontally extended to ISO/IEC 10646. As they are already coded, we have checked all attributes and supplied our glyph fonts. Details of these characters are provided in Appendix C.

The character "㪍 (U+21290)" in MSCS-2020 was already horizontally extended to ISO/IEC 10646, but the source reference needs to be changed from MAC-00077 to MD-21290. Its glyph also needs to be updated. Since it is not a new horizontal extension request, it is not listed in Appendix C, but listed in Appendix A.

Since symbols are beyond the scope of horizontal extension, 16 symbols included in MSCS-2020 are not listed in Appendix C, but listed in Appendix A.

For IVSes registration of variants, both variants and the corresponding base characters should be registered. Therefore, MSARG submits the respective base characters in Big-5 and HKSCS for IVS registration as horizontal extension to ISO/IEC 10646.

The basic information of the characters for proposed horizontal extension is as follows:

Current Character Set	Source Reference	Number of Chinese Characters
MSCS	MD-*hhhh[h]* MDH-*hhhh[h]*	196
Big-5	MB-*hhhh*	17
HKSCS	MA-*hhhh*	42
Total		255

3.3 Proposed IVSes Registration

In the 2016-08-15 version of the IVD, 11 variants and 10 base characters were registered, along with the MSARG IVD collection itself. The pattern for the sequence identifiers is *M([AB]_[0-9A-F]{4}|C_[0-9]{5}|D_[0-9A-F]{4,5}|E_[0-9A-F]{4,5}_[0-9]{3})*. The format of the sequence identifiers differs slightly from their source reference: 1) The sequence identifiers use underscores in lieu of hyphens per Section 3 of UTS #37; and 2) for the base characters in Big-5, MB is used, and not further distinguished as MB1 or MB2.

MSCS-2020 includes 79 variants, 11 of which were registered the 2016-08-15 version of the MSARG IVD collection. The 68 remaining variants still need to be registered. Because both the variants and their corresponding base characters need to be registered, there are 65 base characters and 68 variants included in this submission. This submission therefore includes 133 proposed new sequences to be added to the registered MSARG IVD collection. All of the variants are included in MSCS-2020. Some base characters are in MSCS-2020 proper, but some are also in Big-5 and HKSCS.

Since the corresponding base characters should also be registered, the number of IVSes in the MSARG collection is as follows:

Status	Number		Description
	Base Character	Variant	
Registered in 2016	10	11	
To be registered	65	68	• They are to be added to the registered MSARG IVD collection. • Pattern for the sequence identifiers is unchanged: *M([AB]_[0-9A-F]{4}|C_[0-9]{5}|D_[0-9A-F]{4,5}|E_[0-9A-F]{4,5}_[0-9]{3})*
Total	75	79	

The information of the base characters in Big-5 (MB) and HKSCS (MA) is summarized as follows:

	Base Characters in Big-5 (MB)	Base Characters in HKSCS (MA)
Registered in 2016	1	5
To be registered	16	37
Total	**17**	**42**

Details of the variants to be registered as well as the corresponding base characters are listed in Appendix D.

The ~~temporary~~ web site for IVSes registration is changed from http://www.iso10646hk.net/ivd/MSARG/ to https://www.safp.gov.mo/mscs/ivs/.

4 Contact Information

Any queries about the information of the characters, please contact: Mr. Clement Chau (cchau@safp.gov.mo) and Ms. Cheang Pui Pui (ppcheang@safp.gov.mo). We greatly appreciate the effort of all IRG members and ideographic experts.

Appendix A –MSCS-2020 Character Repertoire
Appendix B – List of Proposed UNC Characters
Appendix C – List of Proposed Characters for Horizontal Extension
Appendix D – List of Proposed Characters for IVSes Registration

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