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1. Background

As we know, the approach to encode Tangut characters dates back to the 1970s. The earliest proposal was designed by Grinstead in the Oriental Manuscript Department of the British Museum, and was published in the book *Analysis of the Tangut Script*¹ in 1972, which listed 5819 characters in the sequence of strokes.

In the 1980s, the Tibeto-Burman Linguist George van Driem from Leiden University once started a program on research and development of Tangut computer fonts in joint hands with the Tangut Linguist K. B. Kepping from St. Petersburg Institute of Oriental Studies of Russian Academy of Sciences. But the study discontinued after two years due to technological reasons.

In the year of 1996, the first set of complete Tangut fonts was established by the Research Association on the *Wen Zi Jing* in the Institute of Asian and African Languages and Cultures of Tokyo University of Foreign Studies in Japan, with Motoki Nakajima in charge of the study.² In the following few years, many books were edited and published using this set of fonts.³ However, since there was no input method available for indexing the fonts, it was rarely used in the Tangut academic circle of China.

In the year of 1999, the Xia-Han Character Processing System was officially published which was developed by the Computing Center of Ningxia University in China in the leadership of Ma

¹ Eric Grinstead, *Analysis of the Tangut Script*, Lund: Studentlitteratur, 1972, pp. 152-183: "Telecode- Wenhai Conversion Table".

² Edited by Motoki Nakajim; Kenji Imai, 高桥まり代協力 *Analysis of the Tangut Script* the Institute of Asian and African Languages and Cultures, Tokyo University of Foreign Studies, 1996

³ Such as Li Fanwen、 Motoki Nakajima *Research on the Computer Processing of Tangut character collection*, National Institute of Asian and African Languages and Cultures, 1997. Shi Jinbo、 Motoki Nakajima *Studies on Computer Processing of Tangut <Wenhai Baoyun>*, National Institute of Asian and African Languages and Cultures, 2000.

Xirong.⁴ A set of 6000 Tangut fonts were created. The application of these fonts has solved the problem of mixed-script typesetting such as Tangut versus Chinese or even Western scripts. Furthermore, the input method of this set of fonts adopted the “four-corner numbering” method designed by Li Fanwen in his *Xia-Han Dictionary*,⁵ which has made the Tangut character inputting very convenient. On the other hand, there are still a number of drawbacks, such as miscoding, absence of coding, missing characters, wrong glyphs, etc.

In the early 21st century, we were able to see several application-oriented Tangut fonts, to name a few, the fonts developed by Han Xiaomang from the Research Center of Tangutology in Ningxia University,⁶ the fonts developed by the Institute of Linguistics in Taiwan’s Academia Sinica,⁷ the fonts developed by Kyoto University of Japan.⁸ None of these fonts was able to be issued to the public. In general, they are used in the publishing of Tangut works. Of these fonts, Taiwan’s set of fonts is established in accordance with the original glyphs in the dictionary of *Tong Yin*, and hence most similar to those of Tangut literatures in glyph.

In the year of 2005, the fonts established by Jing Yongshi were published. It was not only practical and convenient for the input method, but has also corrected many errors in the Xia-Han Character Processing System. This set of fonts replaced the other systems in a very short time, and are used widely by Scholars of Tangutology.

After years of practice, the scholars realize more and more strongly that the ideal Xi-xia fonts should be in regular script. More than that, each character should be deprived directly from original Tangut literatures, not merely from today’s facsimiles. As far as we can see, of all the Tangut literatures, the most suitable dictionary for graph reference is a dictionary named *Tong Yin* (sometimes transferred as *Yin Tong*).⁹ This book has been revised for several times during Xi-xia dynasty, and therefore can provide various neat block-printed editions. Besides, this dictionary included more characters than any other Tangut literatures. Regarding there are some missing characters or wrong glyphs, we can proofread the errors studying and comparing its different editions.

2. Working Procedure

We are now engaged in the task of cutting out characters from the Xi-xia dictionaries. Among these we have chosen three different editions of *Tong Yin*, namely 207, 208, 209, as well as the Jia and Yi versions of *Wen Hai*. Besides, characters from *Fan-Han Heshi Zhangzhongzhu*, *Tong Yin*,

⁴ Ma Xirong, *Xia-Han Character Processing and Electronic Dictionary* (CD edition), Tsinghua University Press, 1999.

⁵ Li Fanwen *Xia-Han Dictionary*, Chinese Social Science Press, 1997.

⁶ Samples refer to Li Fanwen’s *Xia-Han Dictionary*, Chinese Social Science Press, 1997.

⁷ Samples refer to Gong Huangcheng’s *Essays on Tangut Language and Script*, Institute of Linguistics in Taiwan’s Academia Sinica (筹备处) 《语言暨语言学》专刊丙种之二 (上), 2002; Lin Yingjin’s *Transcription Studies on the Tangut <Zhen Shi Ming Jing>*, 《语言暨语言学》专刊甲种之八, 2006.

⁸ Samples refer to E. I. Kychanov’s *Tangut Dictionary*, Kyoto University, 2006.

⁹ Photos of all literatures refer to St. Petersburg Institute of Oriental Studies, Russian Academy of Sciences, Institute of Ethnology and Anthropology, Chinese Academy of Social Sciences, Shanghai Ancient Books Press *Russia-stored Khara-Khoto Literatures*. vol. 7, Shanghai: Shanghai Ancient Books Press, 1996, p.1-121.

Wuyin Qieyun and other dictionaries will be added as conducting a contrast study. In the end, all the characters constitute a normalized character list based on Original Tangut literatures. After that we are going to make a new set of Tangut fonts on the basis of the above list. Also, errors in the former computing fonts will be corrected at the same time.

3. Working Progress

By now we have finished the task of cutting out characters from *Tong Yin*. Next, we are going to cut out characters from *Wen Hai*, *Fan-Han Heshi Zhangzhongzhu*, *Tong Yi*, *Wuyin Qieyun*, etc., and conduct a comparison study on glyphs. After that, a normalized Tangut character list will be put forward, to which new characters and taboo characters found by scholars in other materials will be supplemented, forming the final character list. The whole program is due to finish at the end of 2013.