Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Organisation Internationale de Normalisation
Международная организация по стандартизации

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0. Introduction

0.1. Basic introduction

JIANZI (减字) is basically a notation used to record the approaches of playing Chinese Guqin (古琴, one kind of seven-string musical instrument in China) and is the most ancient Chinese musical notation which is still in use in the real world. In 2003, the art of Guqin music was proclaimed as one of the *Masterpieces of the Oral and Intangible Heritage of Humanity* by UNESCO. Fig. 0.1.1 shows the information on the website of UNESCO, Fig. 0.1.2 shows a common style of Guqin. Note the English name of this musical instrument also follows Section 4.2.1 of GB/T 33726-2017 *Musical instrument’s Chinese generic name*.

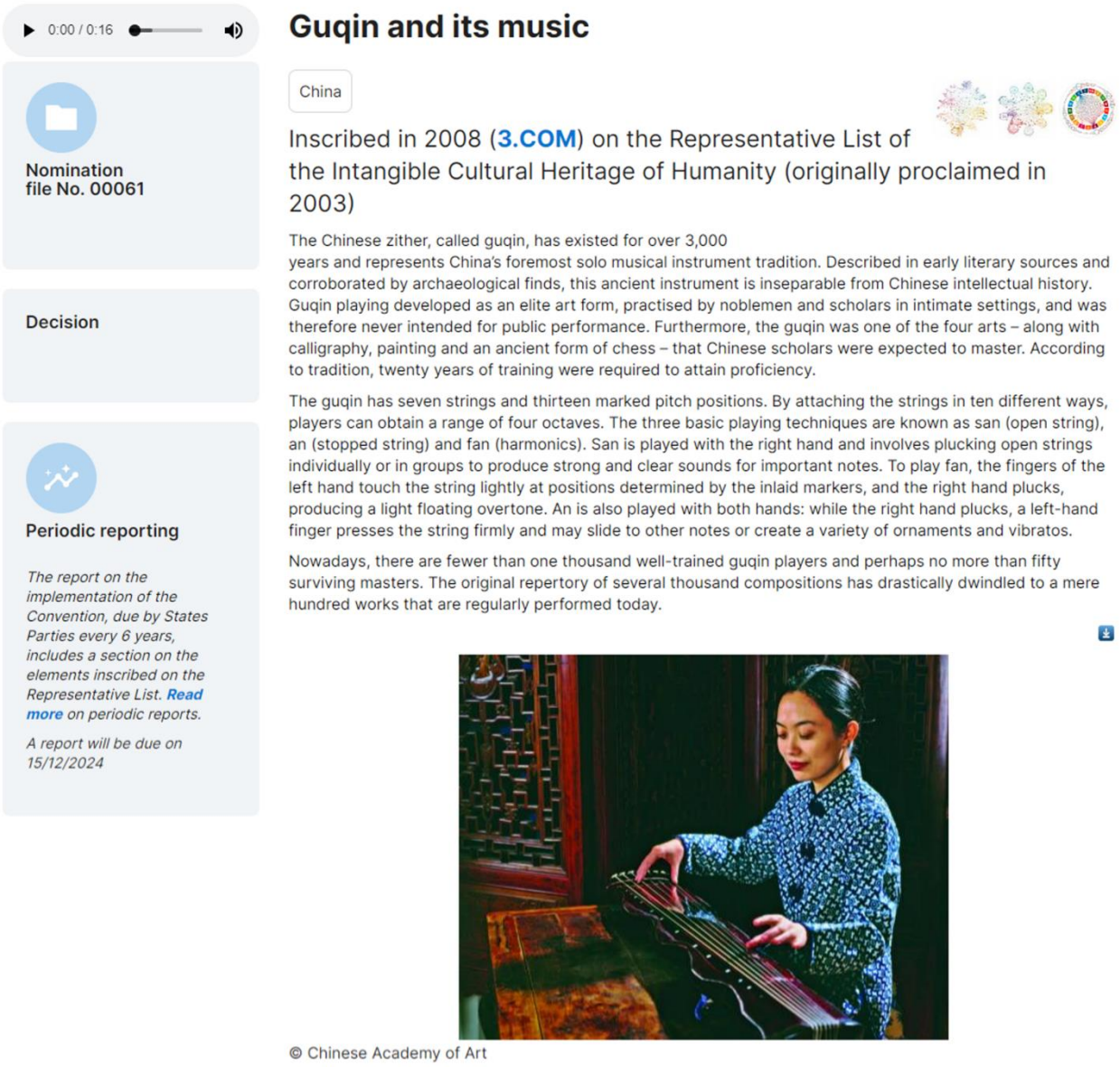


Fig. 0.1.1 Introduction of Guqin and its music on the website of UNESCO
https://ich.unesco.org/en/RL/guqin-and-its-music-00061
[The performer captured in the photo in the webpage screenshot above is one of our music consultants, Researcher Lin Chen (林晨) and the pictures showed on the website are provided by Chinese Academy of Art (中国艺术研究院).]



Fig. 0.1.2 Guqin

The proposed characters and clusters in this document are called as Jianzi or Jianzi Musical Notation. Comparing with Chinese Guqin, an instrument of three thousand years, the history of Jianzi is relatively much shorter that it has been more than one thousand years since Jianzi was developed in Tang Dynasty of China.
Before Jianzi was invented, the music record of Chinese Guqin was commonly written via Chinese traditional ideographs that musicians describe their terms of right hand and left hand like they wrote the classical literal Chinese essays. The advantage is that every detailed approach could be comprehensively documented whereas the disadvantage is also obvious that a paragraph could hardly record some musical note. The redundant information when using Chinese traditional ideographs reduces the efficiency and effectiveness of notation. This method was called as Chinese Ideographic Musical Notation or Literal Musical Notation (文字谱), and the first and famous score which used this notation is *Orchid in Seclusion* (《碣石調・幽蘭》) which is now collected in Tokyo National Museum (東京国立博物館) of Japan. Please see Fig. 0.1.3. Almost all the ideographic elements of Chinese Ideographic Musical Notation or Literal Musical Notation have been encoded as CJKUI, and only one unencoded for the fingering letter (指法) 𠂇 has been included in the ongoing IRG WS as WS2021-01460:SAT-05590 which there is still no objections on IRG ORT for IRG WS review now.

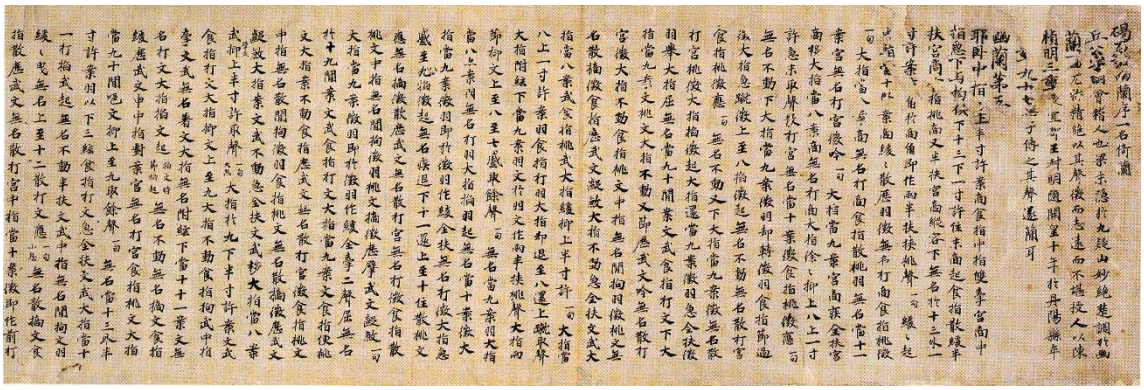


Fig. 0.1.3 Orchid in Seclusion

In the original text of the source of Fig. 0.1.3, the iteration mark is 〻 (U+303B), and it should be changed to the unencoded U+5315 (匕) like form in the green square of the text of the source of Fig. 0.1.4, which was once mentioned in L2/04-029 as No. 5 symbol by Andrew West. The U+5315 (匕) like form is commonly used in Chinese Ming and Qing Dynasties in China and contemporaneous Việt Nam. There are some small-sized Hanzi in Figs. 0.1.3 and 0.1.4 (orange square). Eiso will clarify them in another document later.
As a result, in Tang Dynasty, a few musicians commenced reform of Chinese Ideographic Musical Notation or Literal Musical Notation. They developed new “elements” called Jianzi based on Chinese ideographs and changed them into a new notation, namely Jianzi Musical Notation. Famous Chinese Guqin musicians, such as ZHAO Yeli (赵耶利), CHEN Zhuo (陈拙), CHEN Kangshi (陈康士) and CAO Rou (曹柔), made their contribution to the early reform. Considering their extent of contribution that CAO Rou is recognized as the inventor of the Jianzi Musical Notation by relevant documentation starting from Ming Dynasty of China.

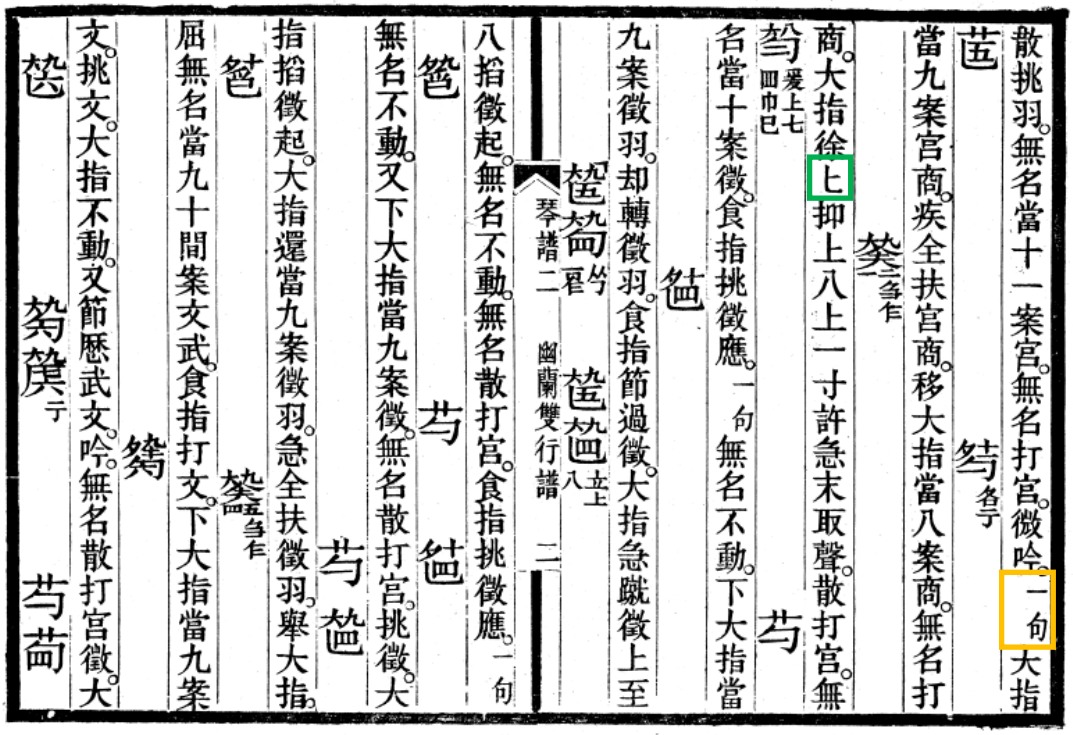


Fig. 0.1.4 Contrastive running text of Orchid in Seclusion with Chinese Ideographic Musical Notation or Literal Musical Notation and Jianzi Musical Notation in Qínxué Cóngshū, Column 3

(The left ones are Jianzi Musical Notation, the right ones are Chinese Ideographic Musical Notation)

Latest in Han Dynasty in China, Chinese Guqin had become a musical instrument which the well-being scholars need to learn. In Tang Dynasty, Chinese Guqin spread to a few East Asian countries or regions and was then accepted, such as in Japan and Korean Peninsula. Jianzi as part of the Chinese Guqin had thus been used in those regions. Although there was the crisis after second world war that according to a survey there were less than 300 people who could still play the musical instrument not to mention the Jianzi. But now the figure has grown more than 1,000 times. A simple and rough calculation shows that number of people who use Jianzi has reached 500,000 only in Chinese mainland.

Until the founding of People's Republic of China, there are about 150 books of scores of Chinese Guqin written with Jianzi Musical Notation which contains more than 3,000 songs. The modern musicians tried to improve the Jianzi system by using staff / western musical notation to address deficiencies of rhythm indication. Some even tried to completely replace Jianzi or make it as a part of staff / western musical notation or number musical notation. However, after more than 70 years practice, it proves in the end that Jianzi and Jianzi Musical Notation cannot be replaced. Despite of the deficiencies, Jianzi and Jianzi Musical Notation are still the best writing system to record Chinese Guqin music. Please also read the modern phylogeny of Chinese Guqin and Jianzi Musical Notation in the books *Chùmō Qín-shǐ* and *"Yuègǎi" Jìshì Běnmò*.

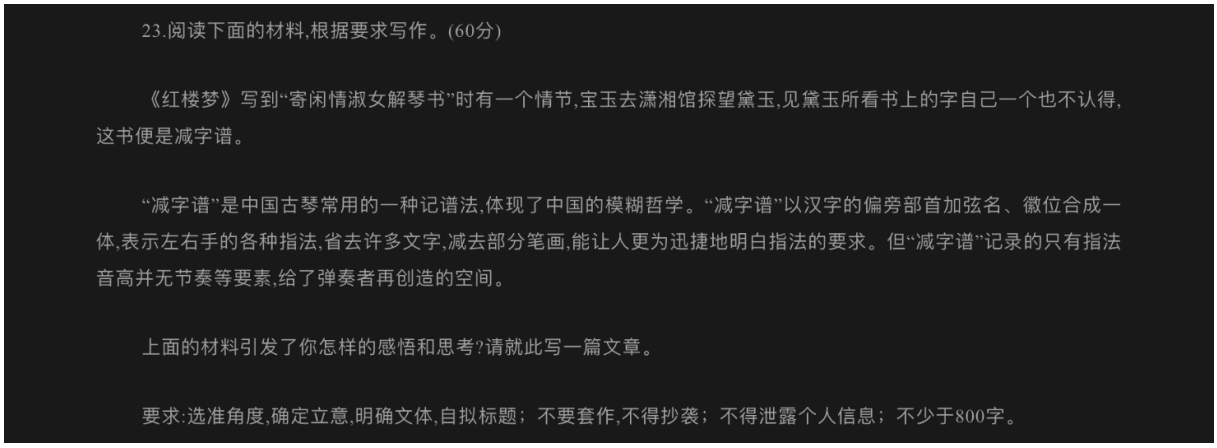
As Eiso wrote in L2/22-206, "Generally, Jianzi Musical Notation (减字谱) is always used as the musical notation only for Guqin for the modern uses, so many people treat the term 减字谱 as the same as the term 古琴谱 (or 琴谱). When we need to handle the elements of all running scores of Jianzi, we also need to meet the scores with Jianzi Musical Notation used for Se (瑟). The original meaning of the term 减字 is to reduce some components or strokes and splice the new reduced elements sequentially without confusing the semantics.", which has been presented in CJK & Unihan Group meeting for UTC #173. So, for some more big-picture perspective, the native name Jianzi (Musical Notation) is the best name for our encoding works, and we will use Guqin score as the scores only used for Guqin with Jianzi Musical Notation.

In the Chinese history, Guqin, Game of Go, Calligraphy and Painting (琴棋書畫) are treated as a must for scholars and literati to cultivate themselves, among which Guqin is listed as the most important skill. In Chapter 86 of *Hónglóu Mèng* (《红楼梦》, aka *Dream of the Red Chamber*) which is one of four classical masterpieces in China, Jiǎ Bǎoyù (贾宝玉) and Lín Dàiyù (林黛玉) were talking about the Jianzi Musical Notation. Three of four big-sized "characters" mentioned in Fig. 0.1.5 are 勺 (散勾一弦, red line), 勩 (大指九徽勾五弦, green line) and 𢆶 (大指五徽六分抹五弦, blue line).

宝玉也不答言，低着头，一径走到潇湘馆来，只见黛玉靠在桌上看书。宝玉走到跟前，笑说道："妹妹早回来了？"黛玉也笑道："你不理我，我还在那里做什么？"宝玉一面笑说："他们人多说话，我插不下嘴去，所以没有和你说话。"一面瞧着黛玉看的那本书，书上的字一个也不认得。有的像"勺"字；有的像"茫"字；也有一个"大"字旁边，"九"字加上一勾，中间又添个"五"字；也有上头"五"字"六"字又添一个"木"字，底下又是一个"五"字。看着又奇怪，又纳闷，便说："妹妹近日越发进了，看起天书来了！"黛玉嗤的一声笑道："好个念书的人！连个琴谱都没有见过。"宝玉道："琴谱怎么不知道？为什么上头的字，一个也不认得？妹妹，你认得么？"黛玉道："不认得，瞧他做什么？"宝玉道："我不信，从没有听见你会抚琴。我们书房里挂着好几张，前年来了一个清客先生，叫做什么嵇好古，老爷烦他抚了一曲。他取下琴来，说都使不得；还说：'老先生若高兴，改日携琴来请教。'想是我们老爷也不懂，他便不来了。怎么你有本事藏着？"

Fig. 0.1.5 Hónglóu Mèng, p. 974

This plot is also used for proposition on the mid-term examination of Semester 1 of Senior 3 in 2023 of Nanjing City and Yancheng City, Jiangsu Province (江苏省南京市、盐城市). This part asked the examinees to write a composition based on the ideological inspiration of the short introduction of Jianzi Musical Notation.



23.阅读下面的材料,根据要求写作。(60分)

《红楼梦》写到"寄闲情淑女解琴书"时有一个情节,宝玉去潇湘馆探望黛玉,见黛玉所看书上的字自己一个也不认得,这书便是减字谱。

"减字谱"是中国古琴常用的一种记谱法,体现了中国的模糊哲学。"减字谱"以汉字的偏旁部首加弦名、徽位合成一体,表示左右手的各种指法,省去许多文字,减去部分笔画,能让人更为迅捷地明白指法的要求。但"减字谱"记录的只有指法音高并无节奏等要素,给了弹奏者再创造的空间。

上面的材料引发了你怎样的感悟和思考?请就此写一篇文章。

要求:选准角度,确定立意,明确文体,自拟标题;不要套作,不得抄袭;不得泄露个人信息;不少于800字。

Fig. 0.1.6 Composition topic of the mid-term examination of Semester 1 of Senior 3 in 2023 of Nanjing and Yancheng, https://mp.weixin.qq.com/s/3MWw39R8zYMp8UGVYQqgfw

As we know, some useful symbols of Game of Go, the Xiangqi Symbols and so many CJK Ideographs which could be used in the Chinese Calligraphy have been encoded or defined in CJKUI and other existing blocks, even IVD collections. In our recent encoding works, more and more characters related to different kinds of music have been or will be encoded in UCS and Unicode. Therefore, the Jianzi Musical Notation should be handled as soon as possible. The followings which the names are all related to 减字 are not suitable to include in this document: three kinds of musical notation which were mentioned in L2/22-206; one kind of phonetic system to record the Chinese phonology, which was developed by Ge Zhongxuan (葛中选) in Qing Dynasty; and the Jianzi Musical Notation used for Se, which is very close to the one used for Guqin, and the current encoding model has covered it.
In this section, the hard works on the main idea and writing, the data and historical facts confirmation were finished by Mr. Richard Zou.

0.2 Chinese standards related to Guqin

Up to now, different standardization technical committees have been formulated at least three standards in Chinese mainland. However, all the standards are only related to the bodies and the manufacturing technologies of Guqin. Therefore, no national or regional standards could be referenced as the basis of the repertoire or the encoded character set. These three standards are shown as below.
In 2011, SAC/TC41 (Chinese) National Standardization Technical Committee of Wood (docking with ISO/TC218 Technical Committee of Timber) formulated LY/T 1974.1-2011 *Sawn timber for national music instrument — Part 1: Timber for ancient instrument*, which was released by the National Forestry Administration of PRC at that time. Note that "ancient instrument" means Guqin in this standard.
In the same year, SAC/TC371 (Chinese) National Standardization Technical Committee of Musical Instrument formulated QB/T 4181-2011 *Guqin*, which was released by the Ministry of Industry and Information Technology of PRC. In 2021, SAC/TC371 revised the standard as QB/T 4181-2021 *Qin*. Some English terms referenced the uses in QB/T 4181-2021 in this document. SAC/TC371 also formulated QB 1207-1991 *General technical conditions of national string instrument* in 1991, and this standard was revised as QB/T 1207.1-2011 in 2011 and QB/T 1207.1-2021 in 2021. QB/T 1207.1 also mentioned some English terms.
In 2021, Yangzhou Municipal Bureau of Culture, Radio, Television and Tourism formulated DB3210/T 1082-2021 *Making skills of Guqin* as the local standard of Yangzhou City, Jiangsu Province (江苏省扬州市), which was released by Yangzhou Municipal Market Supervision Administration.

0.3. Current usage

Today, Jianzi Musical Notation is needed in music record, modern publishing, academic research and other digitization work, which are all related to Guqin. The most common usage is to re-typeset the ancient Guqin music scores as modern horizontal layouts based on the traditional right-to-left vertical layouts of the ancient books. Fig. 0.3.1 shows one of the modern horizontal layouts of one famous Guqin score named 《阳关三叠/陽關三叠》 (*Triple Refrain of Yangguan*), which the author of the lyric of the first part is Wang Wei (王维/王維) who is a famous poet in Tang Dynasty of China.

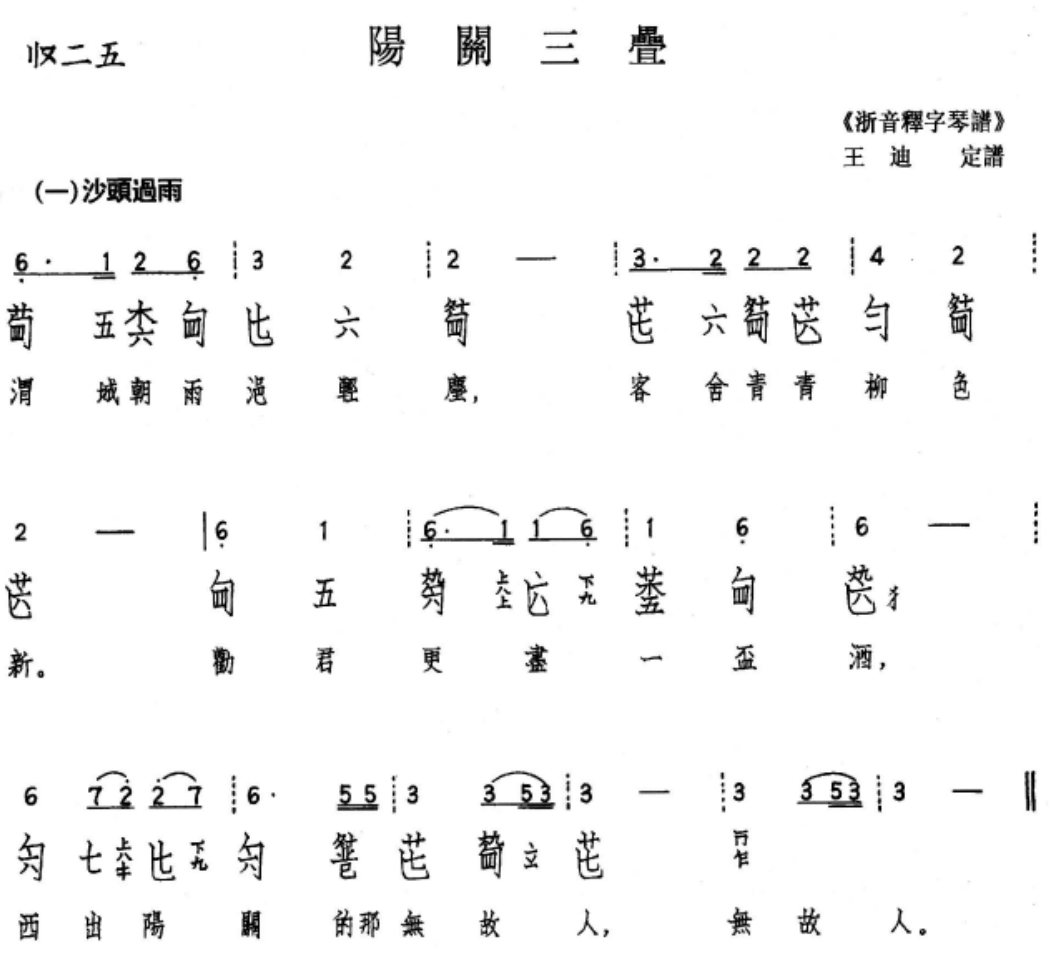


Fig. 0.3.1 Xiángē Yǎyùn, p. 3

Prof. Li Fengyun (李凤云) uses Jianzi Musical Notation to record the song *Smiling, Proud Wanderer* (《笑傲江湖》) in the textbook written by her, which the original authors of this song are Dr. James Wong (黃霑) and Mr. Joseph Koo (顧嘉煇), and the song was released in 1990 originally. The original name is *A Laugh from Vast Sea* (《滄海一聲笑》) sang by Samuel Hui (許冠傑), which was the theme song of the movie *Swordsman* (《笑傲江湖》) directed by King Hu (胡金銓).

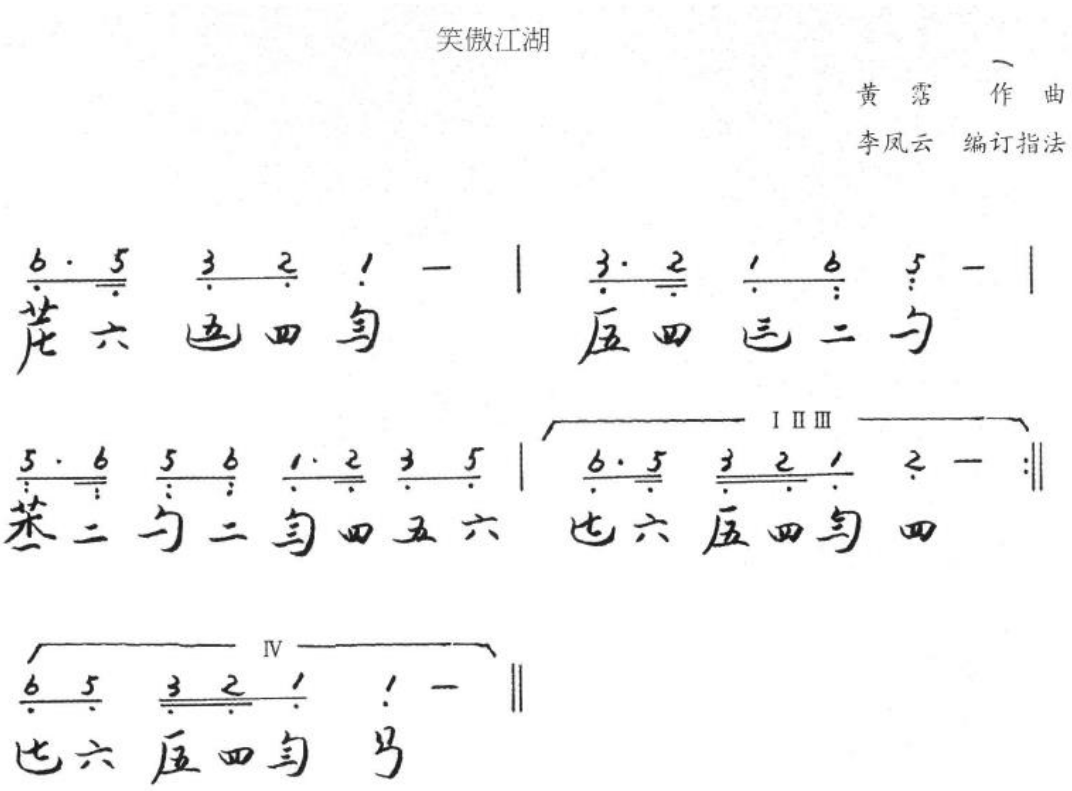


Fig. 0.3.2 Gǔqín Sānshí Kè, p. 23

Mr. Gong Yi (龚一) uses Jianzi Musical Notation to record so many foreign songs in his book, such as the famous Japanese song *Kitakuni no Haru* (北國の春) which the author is Endo Minoru (遠藤実) written in 1977. This song was very popular in China. Jiang Dawei (蒋大为), Teresa Teng (鄧麗君), Fanny Wang (薰妮), Yeh Chi-Tien (葉啟田) and so on once covered this song to Chinese Putonghua/Mandarin versions (《北国之春》 and 《我和你》), Cantonese version (《故鄉的雨》) and Min-nan version (《北國之春》).

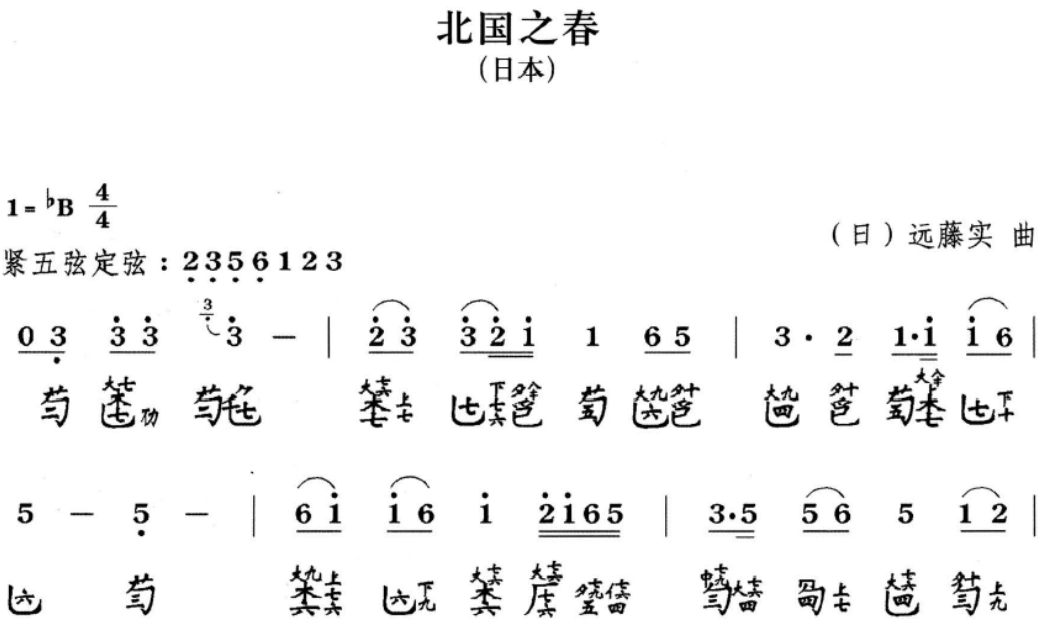
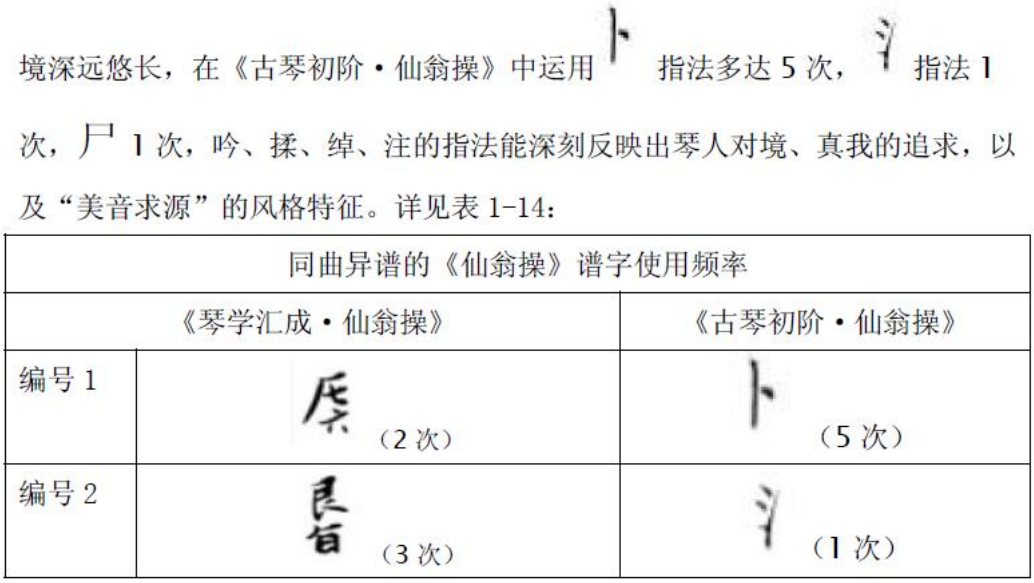


Fig. 0.3.3 Gǔqín Xīn Pǔ, p. 142

We can also find out more than 4,798 entries related on Jianzi Musical Notation in CNKI (2,915 for 减字谱,

1,883 for 古琴谱), more than 268 entries in CQVIP (184 for 减字谱, 84 for 古琴谱), more than 6,369 entries in Baidu Xueshu (329 for 减字谱, 6,040 for 古琴谱). [2023.08.07.] The following shows a graduation thesis related to Guqin and Jianzi Musical Notation.



境深远悠长，在《古琴初阶·仙翁操》中运用 指法多达 5 次， 指法 1 次， 1 次，吟、揉、绰、注的指法能深刻反映出琴人对境、真我的追求，以及“美音求源”的风格特征。详见表 1-14：

同曲异谱的《仙翁操》谱字使用频率		
	《琴学汇成·仙翁操》	《古琴初阶·仙翁操》
编号 1	（2 次）	（5 次）
编号 2	（3 次）	（1 次）

Fig. 0.3.4 Gǔqín Jiǎnzìpǔ zhī Yuèlǐ Wénhuà Chánshì, p. 36

However, the Jianzi Musical Notation has not been clarified and handled in UCS and Unicode. The scholars and users use the pictures or scanned hand-writing glyphs in the articles and books. Mr. Chen Changlin (陈长林), Mr. Bao Songping (包松平), Prof. Chen Genfang (陈根方) and other experts provide their solutions on digitizing, but they only change the glyph shapes in CCDOS/EUC-CN/GB2312 encoding ranges or use PUA (EUDC for CP936/GBK), even SVG, which are not better as we know, and will make the users and data confusing. (Please see Appendix I for more other related discussions.)

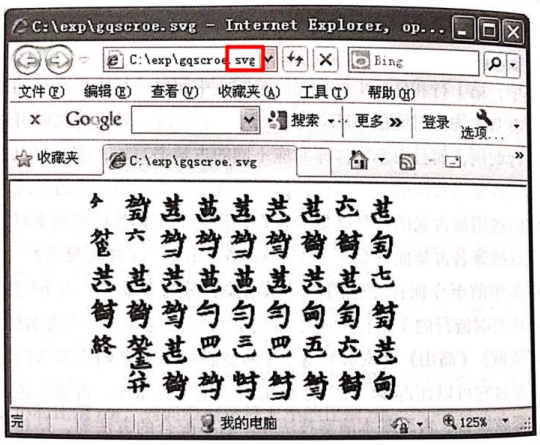


图 3－18 古琴 Web 乐谱重建结果

Fig. 0.3.5 Intelligence Musicology and the Digital Media of Chinese Music, p. 94

In the TVB drama 《新四十二章》/《傲娇与章经》 (*Treasure of Destiny*) for 2023, the girl acted by Judy Kwong (鄺潔楹) showed one copy of Jianzi score as one of the important clues of their treasure hunting to her friend acted by Kamon Kong (江嘉敏). Please see Fig. 0.3.6. We also noticed that the famous lyricist Fang Wenshan (方文山) once used the Jianzi Musical Notation to present the song of *Chrysanthemums Terrace* (《菊花台》/《菊花臺》) in his individual exhibition of installation art, which the song composer and the original singer are both Jay Chou (周杰倫). These mean the Jianzi Musical Notation is still needed in

contemporary Chinese pop cultures. Please see Fig. 0.3.7. Note that Guqin was also mentioned in Jay Chou's new song named *Cold Hearted* (《红颜如霜》/《紅顏如霜》) for 2022, which the lyricist is still Fang Wenshan.

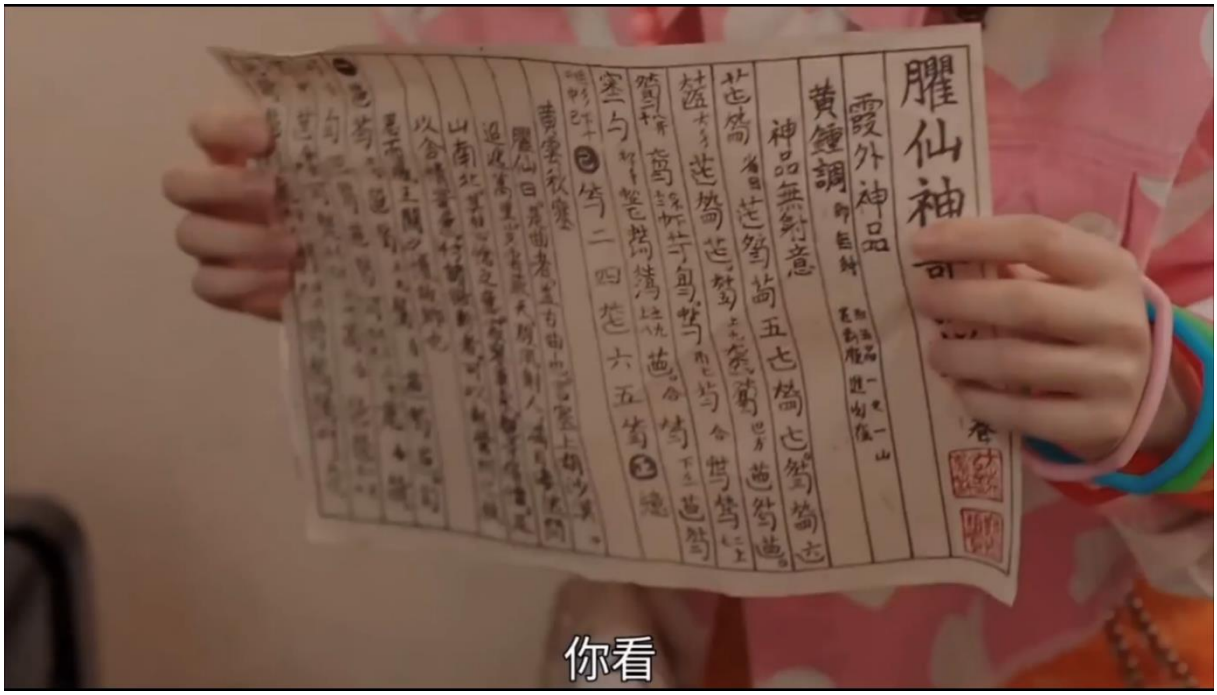


Fig. 0.3.6 Episode 13 of the TVB drama Treasure of Destiny



Fig. 0.3.7 Jianzi version of the song of Chrysanthemums Terrace
(https://weibo.com/ttarticle/p/show?id=2309634702623079989657)

We also show more details on the Guqin societies all over the world in Appendix J.

This year marks the 20th anniversary of the successful application of Guqin and its art for the *Masterpieces of the Oral and Intangible Heritage of Humanity*, and we believe the modern usages will be more and more when the Jianzi Musical Notation been encoded in UCS and Unicode.

0.4. Encoding history

China NB once submitted 3981 characters to IRG CJK_C2 collection in IRGN1199 in 2006. 13 of them could be used for Guqin, and these 13 and other 15 all could be used for Se. As we know, IRG CJK_C2 project had not been started after IRG CJK_C1 collection was accepted as CJK Ext. C, and these 3981 characters have not been re-submitted as a whole.

China NB once submitted G_CY2255 to IRG CJK_F1 collection in IRGN1886 in 2012, which the source is 《辞源》第二版 (*Cíyuán*, the second edition), p. 2255, and the SN in IRGN1886A1 is 1303.



Fig. 0.4.1 G_CY2255 in IRGN1886

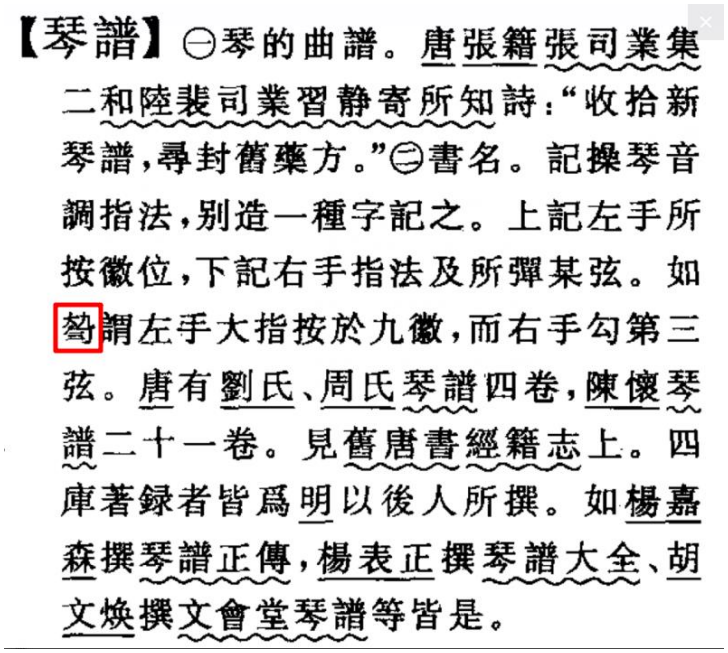

【琴譜】㊀琴的曲譜。唐張籍張司業集二和陸裴司業習靜寄所知詩："收拾新琴譜，尋封舊藥方。"㊁書名。記操琴音調指法，別造一種字記之。上記左手所按徽位，下記右手指法及所彈某弦。如勾謂左手大指按於九徽，而右手勾第三弦。唐有劉氏、周氏琴譜四卷，陳懷琴譜二十一卷。見舊唐書經籍志上。四庫著録者皆爲明以後人所撰。如楊嘉森撰琴譜正傳，楊表正撰琴譜大全、胡文煥撰文會堂琴譜等皆是。

Fig. 0.4.2 Evidence of G_CY2255

In IRGN1921 and IRGN1945 (aka two versions of CJK_F1 collection, v1.0), the SN for G_CY2255 was 01689, which the IDS was ⿰⿸⿰一丨大九⿰丿乙乙三.



Fig. 0.4.3 CJK_F1-01689 in IRGN1921

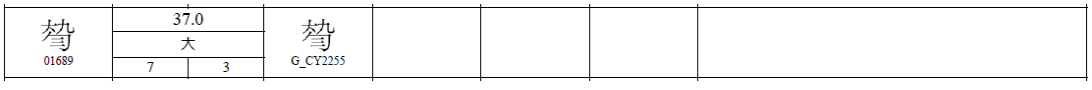


Fig. 0.4.4 CJK_F1-01689 in IRGN1945

Japan NB pointed out the evidence was unclear in IRGN1945_JPN_Review_attachP1.pdf.



Fig. 0.4.4 Japan NB's review comment on CJK_F1-01689 in IRGN1945

In IRG #41, China agreed to delay this character for ExtF1 because it's not the ideographs and not suitable to encode in CJKUI blocks. This decision was recorded in IRGN1973Appendix-Part2.pdf by Dr. Chen Zhixiang (陈志向) and Dr. Zhang Yifei (张翼飞).
IRGN1979CJK_F1v2.0.xls showed the discussion record is "delayed for more clear evidence (k), irg41."



Fig. 0.4.5 The conclusion for CJK_F1-01689 in IRG #41

Andrew West added G_CY2255 in his famous CJK font, BabelStone Han, after IRG #41, and he provided the comment on the submitted character as "an example of Qinpu notation but not a CJK ideograph". Note that Qinpu Notation is the other name of Jianzi Musical Notation here.
The followings are the documents related to complex ideographs, Han ligature and Jianzi Musical Notation.
2017.04 WG2 N4796=L2/17-150 *Proposal to add new block "CJK Complex Ideographic Symbols"* (Suzuki Toshiya) [151-B.4.2]
2017.11 WG2 N4915=L2/17-373R *Proposal to Encode Two Vietnamese Alternate Reading Marks* (Lee Collins, Ngô Thanh Nhàn) [153-B.4.6, Section 9.1.1 of WG2 #67 minutes, Section 9.2.1 of WG2 #68 minutes]
2018.08 WG2 N5011=L2/18-281 *Comments on proposed Vietnamese Reading Marks* (Andrew West, John Knightley, Eiso Chan) [157-C.6, Section 9.2.1 of WG2 #68 minutes]
2018.10 WG2 N5026=L2/18-318 *Response to L2/18-281* (Lee Collins, Ngô Thanh Nhàn) [158-B.11.4.1.3.1, Section 9.2.1 of WG2 #68 minutes]
2019.04 WG2 N5041=L2/19-107 *Preliminary proposal on encoding Jianzi Musical Notation and Jianzi Format Controls* (Culture and Art Publishing House) [Section 10.3.8 of WG2 #68 minutes, Section 17 of Script Ad Hoc Group recommendations to UTC #160]
2019.05 IRGN2372 *A short introduction to Jianzi Musical Symbols encoding* (Eiso Chan) [Recommendation IRG M52.9, Section 7 of IRG #52 Editorial Report on Miscellaneous Issues]
2019.05 IRGN2382 *Information on Vietnamese Reading Marks* (Eiso Chan) [Recommendation IRG M52.13]
2019.06 WG2 N5074=L2/19-226 *Comments on WG2-N5041* (China National Database of Characters Program) [Section 10.3.8 of WG2 #68 minutes]
2019.07 Section 1 of WG2 N5095 *Comments on WG2 #68 documents* (Deborah Anderson, et al.) [Section 10.3.8 of WG2 #68 minutes]
2019.10 IRGN2413R2 *Request to clarify some IDS issues* (Eiso Chan) [Recommendation IRG M53.6 and M53.11, Section 6 of IRG #53 Editorial Report on Miscellaneous Issues]
2020.06 Section 6.4 of IRGN2429R=L2/20-234 *V0-Source corrections* (Eiso Chan) [Recommendation IRG M56.10, Unihan-UTC165-R11]
2021.09 IRGN2492EisoFeedback=L2/21-165 *Feedback on IRGN2492 and the preliminary encoding method of early Chinese organic chemical character, Sanskrit transcription, Tibetan transcription, Tangut transcription and Jianzi Musical Notation* (Eiso Chan) [Recommendation Unihan-UTC169-R05, Section 14 of Script Ad Hoc Group recommendations to UTC #170, 170-A40]
2022.09 L2/22-206 *Proposal to add 38 characters used for the Chinese traditional musical notation to UAX #45* (Eiso Chan) [Section 28 of CJK & Unihan Group recommendations for UTC #172, 172-C21]
2022.09 Section 4.6 of IRGN2551EisoFeedback *Feedback on IRGN2551 Rules to Restrict the Encoding of Modern "Self-created Characters"* (Eiso Chan) [Recommendation IRG M59.4, Section 6 of IRG #59 Editorial Report on Miscellaneous Issues]
2022.10 IRGN2578 *Comments on encoding early Chinese organic chemical character in WS2021 and other complex ideographs* (Eiso Chan) [Recommendation IRG M59.14, Section 11 of IRG #59 Editorial Report on Miscellaneous Issues]

2023.3 IRGN2578JunliangFeedback *Feedback on IRGN2578 "Comments on encoding early Chinese organic chemical character in WS2021 and other complex ideographs"* (Huang Junliang) [Section 8 of IRG #60 Editorial Report on Miscellaneous Issues]

2023.3 IRGN2581Feedback=L2/23-073 *About the Encoding Model on Han Ligatures* (CheonHyeong Sim) [Section 9 of IRG #60 Editorial Report on Miscellaneous Issues, Section 29 of CJK & Unihan Group recommendations for UTC #175]

0.5. Encoding experts

The Culture and Art Publishing House organized a team on the Jianzi Musical Notation encoding works. During the works, so many experts provided their professional comments to make the documents well. The following is the experts list.

If any UTC or WG2 or IRG expert has comment on this proposal, please connect with Mr. Eiso Chan.

Music Consultant:	WU Zhao (吴钊), LIN Chen (林晨)
Design Consultant:	Gerry LEONIDAS, SUN Mingyuan (孙明远)
Organizing:	YANG Bin (杨斌), TAO Wei (陶玮), Zhao LIU (刘钊)
Characters Collecting:	Zhao LIU (刘钊), Kushim JIANG (姜兆勤), Cassius WANG (王一如), Tiny WU (吴孟庆), Ziyu CHEN (陈紫瑜), TAO Shanyu (陶山语), LI Zixi (李梓汐), XU Linglan (徐泠岚), MU Chenglin (穆成林), Xicheng YANG (杨翕丞), ZHOU Jingwan (周婧婉), LI Yuan(李媛), Simon SUN Guoliang (孙国梁), LI Yansong (李岩松), LIU Ruizhen (刘锐桢)
Annotating:	Richard ZOU (邹童), GAO Yujie (高雨洁), Ivy LIAO (廖小兰), LEI Zhoubin (雷周斌), MA Zhe (马哲), ZHOU Pu (周璞), Sylvia HUANG (黄紫薇), LU Yi (卢一), Eiso CHAN (陈永聪)
Platform Supporting:	FENG Xiaoping (冯小平), LONG Chao (龙超), CHEN Yue (陈月)[1]
Designing:	Zhao LIU (刘钊), ZHU Kui (朱奎), Yiwei CHEN (陈一玮), DUN Jingjing (顿经晶), Xicheng YANG (杨翕丞), Peilin SONG (宋霈霖)
Translator for Designing Experts:	Xunchang CHENG (程训昌)
Engineering:	Eiso CHAN (陈永聪), Kushim JIANG (姜兆勤)
Encoding:	Eiso CHAN (陈永聪), Kushim JIANG (姜兆勤)
Input Method:	Eiso CHAN (陈永聪)
UI Designing for Input Method:	Zhimu LI (李芷沐)
Providing Comments: *(listed in no particular order)*	IRG, CJK & Unihan Group, Script Ad Hoc Group, Linguistic Society of Hong Kong, VNPF; CHEN Zhuang (陈壮), TANG Yingmin (唐英敏), Andrew WEST (魏安), Ken LUNDE (小林劍), Lee COLLINS (康立論), Peter CONSTABLE, Jaemin CHUNG, Debora ANDERSON, Andrew GLASS, FENG Zhuohui (冯卓慧), LIANG Hai (梁海), Henry CHAN (陳輝恒), SUZUKI Toshiya (鈴木俊哉), HUANG Junliang (黃俊亮), Stephan Hyeonjun STILLER (尹賢儁/尹贤俊/윤현준), Haocun YU (于浩存), John KINGHTLEY (李忠仕), Clerk MA (马起园), Jerry YOU (游程宇), Yi BAI (白易), Yifán WANG (王一凡), Kwan Hin CHEUNG (張羣顯), HOU Xingquan (侯兴泉), Qin LU (陸勤), TAO Yang (陶扬), DU Meng (杜萌), Richard COOK (曲理查), MA Jiannong (马建农), WANG Yujuan (王玉娟), Selena WEI Lin-mei (魏林梅),

[1] CHEN Yue (platform supporting) and Yue CHEN (designing) have the same Chinese name, but not the same person.

	Georg SEIFERT, Rainer Erich SCHEICHELBAUER, NGÔ Thanh Nhàn (吳清閒), YOO Hyunguk/HyunGuk RYU (劉賢国/유현국), XUAN Longyun (玄龙云/현룡운), † CHEN Zhihan (陳志翰/阿怪), † John JENKINS (井作恆)

We hope the experts of IRG, CJK & Unihan Group and Script Ad-hoc Group could focus on reviewing the following parts in this document.

For IRG, please focus on reviewing Section 1.1 and App. A though E. We need to know if the unifications are acceptable and there are any unencoded fingering letters which are also used as other separate Hanzi/Kanji/Hanja/Nôm Characters.

For CJK & Unihan Group, please focus on reviewing Section 3.1, 4.1, 4.3 and 5.

For Script Ad-hoc Group, please review the full proposal, especially the encoding model.

1. Proposal

This section includes two parts. The first one shows the unencoded elements used for Jianzi Musical Notation, the second one shows the control formats.

After the discussions of WG2 N5041 (=L2/19-107), IRGN2372 and other related documents at WG2 #68, IRG #52 and the subsequent long-term research, we recognize the elements used for Jianzi Musical Notation should not be a new script, but should be unified with CJK unified ideographs, so we should only encode new characters that are not already included in CJKUI, and then we provide some methods to make the clusters work with the elements and control formats together.

1.1. Basic elements

This part includes 136 characters. When we checked if there are other use cases with the same shapes of these ones, we just found only one (#2) could also be used as the Zhuang character. Please see the explanation after the table. In CJK & Unihan Group meeting for UTC #169, the group discuss L2/21-118R=IRGN2492 *Preliminary proposal to add a new provisional kIDS property (Unihan)* and the feedbacks, and the group had a consensus to create a new block named *CJK Unified Ideographs Components Supplement* between the *CJK Compatibility Ideographs Supplement* and the end of Plane 2 (SIP) — U+2FA20 through U+2FFFD (1,502 code points). There are enough slots to include such 136 characters there, and four of them are the same as the proposed components by Dr. Ken Lunde and Yi Bai.

Table 1.1.1 List of unencoded components for Jianzi Musical Notation

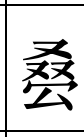
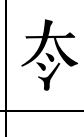
SN	Glyph	IDS	RS	TS	FS	Evidence	Note
1	八	⿱一八	1.2	3	3	App. G #856	
2	口	⿱口一	1.3	4	2	App. H # 1	
3	巨	⿱一⿰丨二一	1.4	5	1	App. G #320	
4	灬	⿱一巛	1.3	4	5	App. H # 2	
5	丐	⿱丁⿱亠丷刀	1.6	7	2	App. G #26	
6	如	⿱如一	1.6	7	5	App. G #119	
7	吞	⿱厶亼冂	1.7	8	5	App. G #60	
8	無	⿱𠂉卌一	1.7	8	3	App. G #71	

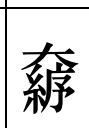
SN	Glyph	IDS	RS	TS	FS	Evidence	Note
9	𠷎	⿱三吅	1.8	9	1	App. G #134	
10	𡰥	⿱⿱丅冂⿱厂⿱亠八	1.9	10	5	App. G #45	
11	𡰪	⿱三单	1.10	11	1	App. G #135	
12	𠂉	⿱丿丶	4.1	2	4	App. G #751	
13	𠂤	⿱丿⿱⿱中一丶	4.6	7	1	App. G #779	
14	𠃣	⿱乚勹	5.2	3	3	App. H # 3	
15	𠃧	⿱乚尸	5.3	4	5	App. G #10	
16	𠃩	⿱乚⿱冂勹	5.4	5	2	App. G #25	
17	𠂇	⿱亠丷刀	8.3	5	4	App. G #16	
18	𠂊	⿱六厶	8.4	6	3	App. G #219	
19	𠂋	⿱六夕	8.5	7	3	App. G #221	
20	𠂌	⿱亠早	8.6	8	2	App. G #193	
21	𠂍	⿱⿱亠丷冂勹	8.6	8	4	App. H # 4	
22	𠂎	⿱亠足	8.7	9	2	App. G #194	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
23	𡨦	⿱六夕厂	8.7	9	3	App. H # 5	
24	𡨧	⿱⿱亠丷冂 ⿱⿱冂勹乚	8.8	10	4	App. H # 6	
25	𡨨	⿱亠品	8.9	11	2	App. G #229	
26	𡨩	⿱六厶弗	8.9	11	3	App. G #233	
27	𡨪	⿱亠最	8.12	14	2	App. H # 7	
28	𡨫	⿱亼冂	9.3	5	1	App. G #57	
29	𡨬	⿱亼夫	9.4	6	1	App. G #245	
30	𡨭	⿱廿儿	10.4	6	1	App. G #211	
31	𡨮	⿱亠八	12.3	1	4	App. G #34 #37	
32	𡨯	⿱八开	12.4	6	1	App. G #604	
33	𡨰	⿱类冂	12.6	8	1	App. G #65	
34	𡨱	⿱⿱亠八⿱冂勹	12.7	9	1	App. H #8	
35	𡨲	⿱反⿱亠八	12.7	9	1	App. G #48	
36	𡨳	⿱北亠八	12.8	10	2	App. H #9	

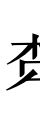
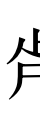
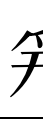
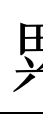
SN	Glyph	IDS	RS	TS	FS	Evidence	Note
37	𠃌	⿵冂勹	13.2	4	3	App. G #12	
38	𠃍	⿵冂勹勹	13.4	6	3	App. H #10	
39	𠃎	⿵⿵冂勹厂	13.4	6	3	App. H #11	
40	𠃏	⿵冂尸	13.4	6	5	App. G #719	
41	𠃐	⿵反亼冂	13.6	8	1	App. H #12	
42	𠃑	⿵冂合	13.6	8	3	App. H #13	
43	𠃒	⿵冖冂勹	14.4	6	2	App. G #21	
44	𠃓	⿵去冖	14.5	7	1	App. G #240	
45	𠃔	⿵叒冖	14.6	8	5	App. G #30	
46	𠃕	⿵冖⿵冂夕勹	14.6	8	2	App. H #14	
47	𠃖	⿵冖业巳	14.8	10	2	App. H #15	
48	𠃗	⿵夕囚	18.4	6	2	App. G #525 #623 #840 #841	
49	𠃘	⿵夕田	18.4	6	2	App. H #16	

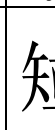
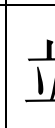
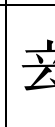
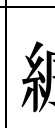
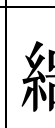
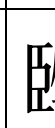
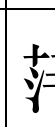
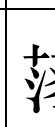
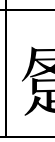
SN	Glyph	IDS	RS	TS	FS	Evidence	Note
50	劝	⿰不力	19.4	6	1	App. G #722	
51	匐	⿰勹弗	20.5	7	5	App. G #226	
52	匏	⿰勹扯	20.6	8	1	App. H #17	
53	卡	⿱十一	24.1	3	1	App. G #908	
54	卉	⿱十二	24.2	4	1	App. G #910	
55	卉	⿱十三	24.3	5	1	App. G #912	
56	卜	⿸卜	25.0	2	0	App. G #734	
57	占	⿰卜日	25.4	6	2	App. G #282	
58	卿	⿰角卩	26.7	9	3	App. G #277	
59	厽	⿳厶冂厂	27.5	7	3	App. H #18	
60	厾	⿰弗厂	27.5	7	5	App. H #19	
61	厤	⿱厂⿰六厶	27.6	8	4	App. H #20	
62	厹	⿰侖厂	27.8	10	3	App. H #21	
63	厺	⿳厶冂勹	28.4	6	2	App. H #22	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
64		⿰厶弗	28.5	7	5	App. H #23	
65		⿰叒冖厶	28.8	10	5	App. G #29	
66		⿰反十	29.4	6	1	App. G #190	
67		⿰反早	29.8	10	1	App. G #188 #189	
68		⿰反口	30.4	7	1	App. G #47 #680	
69		⿰品冬	30.11	14	2	App. G #882	Maybe as CJK ligature.
70		⿴口丁	31.2	5	1	App. G #200	
71		⿴口叀	31.8	11	1	App. G #204	
72		⿴口娄	31.9	12	4	App. G #175	
73		⿴口婁	31.11	14	2	App. G #172 #173	
74		⿰吉冬	33.8	11	2	App. H #24	Maybe as CJK ligature.
75		⿰大𠂉	37.2	5	2	App. H #25	
76		⿰大氵	37.3	6	4	App. H #26	
77		⿰大巛	37.3	6	5	App. G #90	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
78		⿰冈大	37.4	7	2	App. G #629	
79		⿰大⿰口丁	37.5	8	2	App. G #201	
80		⿰大早	37.6	9	2	App. G #184 #187	
81		⿰大⿸纟序	37.13	16	5	App. H #27	Maybe as CJK ligature.
82		⿸女寸	38.3	6	1	App. G #657	
83		⿰宀毋	39.4	7	2	App. H #28	
84		⿸⺀寸	41.6	9	5	App. G #505	
85		⿰小巛	42.3	6	5	App. G #73	
86		⿰小⿰口丁	42.5	8	2	App. G #202	
87		⿰小⿸纟序	42.13	16	5	App. H #29	Maybe as CJK ligature.
88		⿰反巛	47.4	7	1	App. G #79	
89		⿰北巛	47.5	8	2	App. G #74	
90		⿰矢巛	47.5	8	3	App. G #81	
91		⿰半巛	47.5	8	4	App. G #98	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
92	𠀀	⿱业巳	49.5	8	2	App. G #653	
93	𠀁	⿱⿱北白巳	49.10	13	2	App. G #697	
94	𠀂	⿱弗末	57.7	10	3	App. H #30	
95	𠀃	⿰彳丰	60.4	7	1	App. G #617	
96	𠀄	⿰彳⿱山㠯	60.7	10	2	App. G #843	
97	𠀅	⿱文十	67.2	6	1	App. H #31	
98	𠀆	⿰方开	70.4	8	1	App. G #687	
99	𠀇	⿰⿱日勹巛	72.5	9	3	App. H #32	
100	𠀈	⿰⿱日勹⿱六夕	72.9	13	3	App. H #33	
101	𠀉	⿱日罒	73.5	9	2	App. G #787	
102	𠀊	⿱曲冬	73.7	11	2	App. G #880	Maybe as CJK ligature.
103	𠀋	⿱木乚	75.1	5	5	App. G #20	
104	𠀌	⿱木勹	75.2	6	3	App. G #54	
105	𠀍	⿱木厂	75.2	6	1	App. H #34	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
106		⿰末乚	75.2	6	1	App. H #35	
107		⿰末厂	75.3	7	1	App. H #36	
108		⿳木冂勹	75.4	8	2	App. H #37	
109		⿰木⿳冖冂勹	75.6	10	4	App. H #38	
110		⿰末弗	75.6	10	1	App. H #39	
111		⿰⺁尸	77.3	7	5	App. G #3	
112		⿳冫一ナ	87.3	7	1	App. G #771	
113		⿰犭罢	94.10	13	2	App. G #481	
114		⿰田厶	102.2	7	5	App. H #40	
115		⿳田𠂒八	102.5	10	4	App. H #41	
116		⿰犬⿴	105.5	10	1	App. G #146	
117		⿰犬⿰刍攵	105.9	14	3	App. H #42	
118		⿳犬弗⿰六夕	105.12	17	5	App. H #43	
119		⿱刍攵白	106.9	14	3	App. H #44	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
120		⿰矢立	111.5	10	4	App. H #45	
121		⿱立丶	117.1	6	4	App. H #46	
122		⿳亠丷⿰丁厶	117.3	8	5	App. G #52	
123		⿰糸犭	120.3	9	3	App. G #454	
124		⿰糸⿱力尸	120.6	12	5	App. H #47	
125		⿰糸序	120.7	13	4	App. H #48	
126		⿰糸⿱山亘	120.7	13	2	App. H #49	
127		⿰糸⿱正尸	120.9	15	1	App. H #50	
128		⿰糸品	120.9	15	2	App. H #51	
129		⿰糸⿱乱尸	120.11	17	3	App. H #52	
130		⿰臣⿱𠂉一	131.3	9	3	App. H #53	
131		⿱艹⿰氵干	140.6	10	4	App. G #404	
132		⿱艹⿰氵犭	140.6	10	4	App. G #472	
133		⿱反足	157.4	11	0	App. H #54	

SN	Glyph	IDS	RS	TS	FS	Evidence	Note
134	辽	⿺辶亍	162.3	7	1	App. G #397	
135	迖	⿺辶犭	162.3	7	3	App. G #473	
136	阨	⿰阝戹	170.4	7	5	App. H #55	

The character name format for the possible new block *CJK Unified Ideographs Components Supplement* has not been discussed, but I think the form "CJK UNIFIED IDEOGRAPHS COMPONENT-XXXXX" is acceptable, which XXXXX means UCS and Unicode code point here. This is similar to the format used in CJKUI blocks. For example, the character name of U+2FA20 should be CJK UNIFIED IDEOGRAPHS COMPONENT-2FA20.

The UCD property information should be set as below.

```
XXXXX;CJK UNIFIED IDEOGRAPHS COMPONENT-XXXXX;Lo;0;L;;;;;N;;;;;
```

The current script values for the *CJK Radicals Supplement* and *Kangxi Radicals* blocks are "Han", so it is better to use "**Han**" for the new block as the same. Note that the current script value for the *CJK Strokes* block is "**Common**", which has made some confusions. (Please also see L2/22-115, L2/22-137, L2/22-205, IRGN2581EAFeedback, IRGN2581SATFeedback, etc) The EastAsianWidth values should be "**W**", the VerticalOrientation values should be "**U**".

There are four characters listed in L2/21-134 submitted by Yi Bai. If these ones could be unified to the submitted supplemental components in SIP, they should be excluded to the candidates; if not, they should be kept as the ordering in Table 1.1.1. Note: SN means the SN in Table 1.1.1, YB means the SN and ID in L2/21-134, HQ means IRGN2225 submitted by Henry Chan and Dr. Lu Qin and its feedbacks, GF2009 means GF 0014-2009 which is a Chinese spoken and written languages norm, BS means the component used in IDS.TXT maintained by Andrew West in BabelStone, CDP means the extensions of Big5 used for Chinese Document Processing lab.

Table 1.1.2 List of the components included in L2/21-134

SN	Glyph	YB	HQ	GF2009	BS	CDP
1	八	4 H3-03	H3-04	262		
8	無	76 P8-01	P8-01	388	56	0x8BBE
48	匆	67 P6-02	P6-03		03	0x8CAF
49	匆	66 P6-01	P6-02		02	

#1 (八) could also be used as the variant of 丌 (U+4E0C), but they are non-cognates for this meaning here, and IRG has confirmed it is a useful component for our encoding works, so there is no need to unify it with 丌 (U+4E0C).

#2 (𠘨) could be used as the variant of U+2BA4F (𫩏) for the Zhuang use as the (standard) Zhuang word guh. Note that U+2BA4F (𫩏) is not the 2nd stage simplified variant of U+5668 (器) here.



Fig. 1.1.1 Sawndip Sawloih, pp. 206-207

For #69, #74 and #102, they are closer to CJK ligatures on the rationale, because the meanings when two elements could be used separately in one typographic logical line and in one East Asian box are totally the same. If we can handle CJK ligatures later, it is also OK to remove them from the list for us.

1.2. Format controls

As Eiso wrote in IRGN2492EisoFeedback and IRGN2578, the encoding model of the complex ideographs we proposed include the basic elements and the format controls. In our solution, there are five format controls, but only four used for Jianzi Musical Notation. In the following table, Glyph 1 means the common represent glyphs which could be used in the code charts if the unification been accepted, Glyph 2 means the suggested specific glyphs in the specific font for Jianzi Musical Notation. In the Character Name column, the upper cells are suggested for the common character names, and the lower cells are suggested for the character names recorded as annotations. For the abbreviations, there are three Latin letters form for the common character names uses, and there are four Latin letters form for the specific Jianzi Musical Notation uses, which will make the abbreviation rules more convenient in their respective fields. We suggest that these format controls could be included in the *Ideographic Symbols and Punctuation* block.

Table 1.2.1 List of the format controls

UCS	Glyph1	Glyph2	Character Name
U+XXXa	IDJ	JZFJ	Ideographic Joiner (IDJ)
			Jianzi Fingering Joiner (JZFJ)
U+XXXb	IDV	JZPJ	Ideographic Virama (IDV)
			Jianzi Prefixed Joiner (JZPJ)
U+XXXc	IDF	JZFR	Ideographic Filler (IDF)
			Jianzi Filler (JZFR)

UCS	Glyph1	Glyph2	Character Name
U+XXXd			Ideographic Small-sized Form Sign (ISF)
			Jianzi Small-sized Form Sign (JZSF)

The script values for U+XXXa, U+XXXb and U+XXXd should be "**Zinh**" for inherited scripts. These characters are only used with CJKUI in the sequences, but we don't have any precedent to include the format controls in the range of CJKUI. Therefore, "Zinh" looks better.

The script value for U+XXXc should be "**Zyyy**" for common script or "**Hani**" for CJKUI. Compared with U+3000 (Ideographic Space), it is only treated as "Zyyy" without any ScriptExtensions value.

The following shows the UCD information.

```
XXXa;IDEOGRAPHIC JOINER;Cf;0;NSM;;;;;N;;;;;
XXXb;IDEOGRAPHIC VIRAMA;Cf;0;NSM;;;;;N;;;;;
XXXc;IDEOGRAPHIC FILLER;Lo;0;L;;;;;N;;;;;
XXXd;IDEOGRAPHIC SMALL-SIZED FORM SIGN;Cf;0;NSM;;;;;N;;;;;
```

The following shows the information for NamesList.txt.

```
@       Format controls for complex ideographs
@+      The glyphs for these format controls in the code charts are arbitrary
and are not visibly rendered.
XXXa    IDEOGRAPHIC JOINER
    = jianzi fingering joiner
    * commonly abbreviated IDJ or JZFJ
XXXb    IDEOGRAPHIC VIRAMA
    = jianzi prefixed joiner
    * commonly abbreviated IDV or JZPJ
XXXc    IDEOGRAPHIC FILLER
    = jianzi filler
    * commonly abbreviated IDF or JZFR
XXXd    IDEOGRAPHIC SMALL-SIZED FORM SIGN
    = jianzi small-sized form sign
    * commonly abbreviated ISF or JZSF
```

The following shows the information for NameAliases.txt.

```
XXXa;JIANZI FINGERING JOINER;alternate
XXXa;IDJ;abbreviation
XXXa;JZFJ;abbreviation
XXXb;JIANZI PREFIXED JOINER;alternate
XXXb;IDV;abbreviation
XXXb;JZPJ;abbreviation
XXXc;JIANZI FILLER;alternate
XXXc;IDF;abbreviation
XXXc;JZFR;abbreviation
XXXd;JIANZI SMALL-SIZED FORM SIGN;alternate
XXXd;ISF;abbreviation
XXXd;JZSF;abbreviation
```

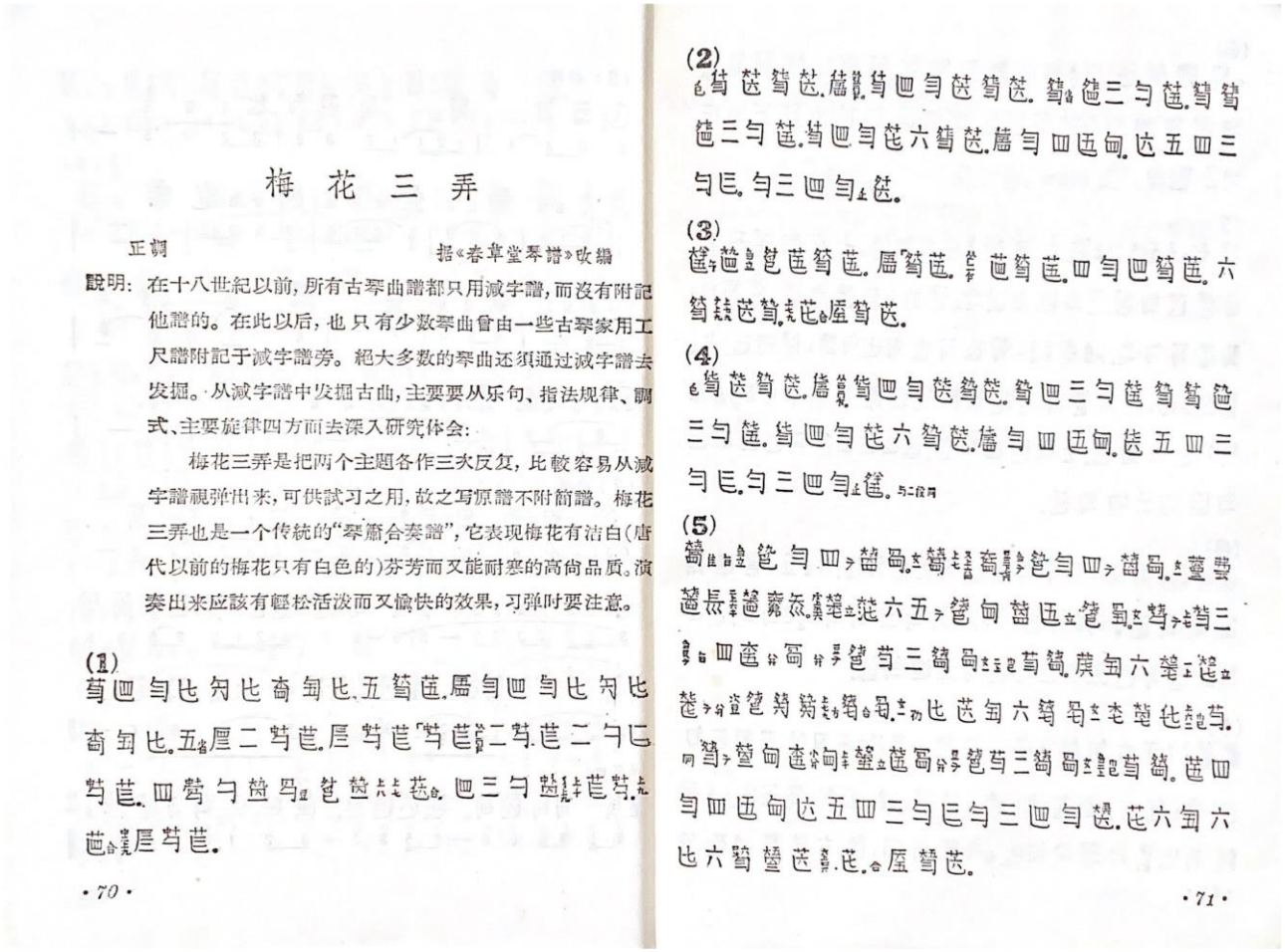
The EastAsianWidth values should be "**W**" like common CJKUI better.
The VerticalOrientation values should be "**U**" like U+16FE4 (KHITAN SMALL SCRIPT FILLER) better.
Note: Eiso once mentioned the format controls in IRGN2492EisoFeedback(=L2/21-165) are not totally the same as the above ones. And Eiso also mentioned that IDJ (JZFJ) is very similar to zwj, but in the current use, zwj is sometimes used for word recording and avoiding the single CJKUI at the beginning of one visual line (孤字成行 or 一字成行) which is similar to the term "runt" in English typography[1], please also see the details on publishing in pp. 42-46 of the book *Shíyòng Chūbǎn Zhīshí Shílíng*; on the other hand, Eiso once provided one of the solutions of zwj + `'ccmp'` to handle the CJK ligatures, please also see the details for WS2021-03670 (Comments #13050 and #13218), the test page on CCAMC and the source code, that means it is better to distinguish zwj and these format controls; if the new `'text-wrap'` feature as `pretty` in CSS can avoid the single CJKUI at the beginning of one visual line well, zwj could be considered using for the CJK ligatures only.

[1] This page shows the definition of the term "runt" is which "can occur anywhere throughout a page or column, and it's when the last line found in a paragraph ends with a single word; this often happens with hyphenated words". Some experts or editors also use the term "orphan" for the same meaning.

2. Details

2.1. General introduction

In most modern books, the Jianzi Musical Notation is written with the numbered musical notation or staff / western musical notation commonly as Figs. 0.3.1, 0.3.2 and 0.3.3 show, but the Jianzi Musical Notation could also be used without other musical notations like the common Han running texts. Please see Fig. 2.1.1 as the modern use.



梅 花 三 弄

正調　　据《春草堂琴譜》改編

說明：在十八世紀以前，所有古琴曲譜都只用減字譜，而沒有附記他譜的。在此以后，也只有少数琴曲曾由一些古琴家用工尺譜附記于減字譜旁。絕大多数的琴曲还須通过減字譜去发掘。从減字譜中发掘古曲，主要要从乐句、指法規律、調式、主要旋律四方面去深入研究体会：

梅花三弄是把两个主題各作三次反复，比較容易从減字譜視弹出来，可供試习之用，故之写原譜不附簡譜。梅花三弄也是一个传統的"琴簫合奏譜"，它表現梅花有洁白（唐代以前的梅花只有白色的）芬芳而又能耐寒的高尚品质。演奏出来应該有輕松活泼而又愉快的效果，习弹时要注意。

(1)

(2)

(3)

(4)

(5)

·70·

·71·

Fig. 2.1.1 Gǔqín Chūjiē, pp. 70-71

Fig. 2.1.2 shows an example of ancient vertical layout of Jianzi scores without other musical notations and Han lyric. The title of this song is 《欸乃歌》 (*Áo'ǎi Gē*). We can see the big-sized "characters" and the small-sized "characters" are used in the same page. The typographic features of the big-sized "characters" are the same as the common Hanzi. For the small-sized "characters", they look like the interlinear notes (夹注) in the traditional Chinese layout, but they are different in fact. We will clarify the differences between them in the following in this document. There are other symbols like the ideographic punctuations. There is also a type as the provisional annotation which is not the necessary element on the page. The provisional annotation would not be added in a large number of books, especially in the modern publications.

All the visual results are called as "某字" in Chinese, but "字" doesn't mean the technical term "character" in several standards, so we use the term "'characters'" for them in this document.

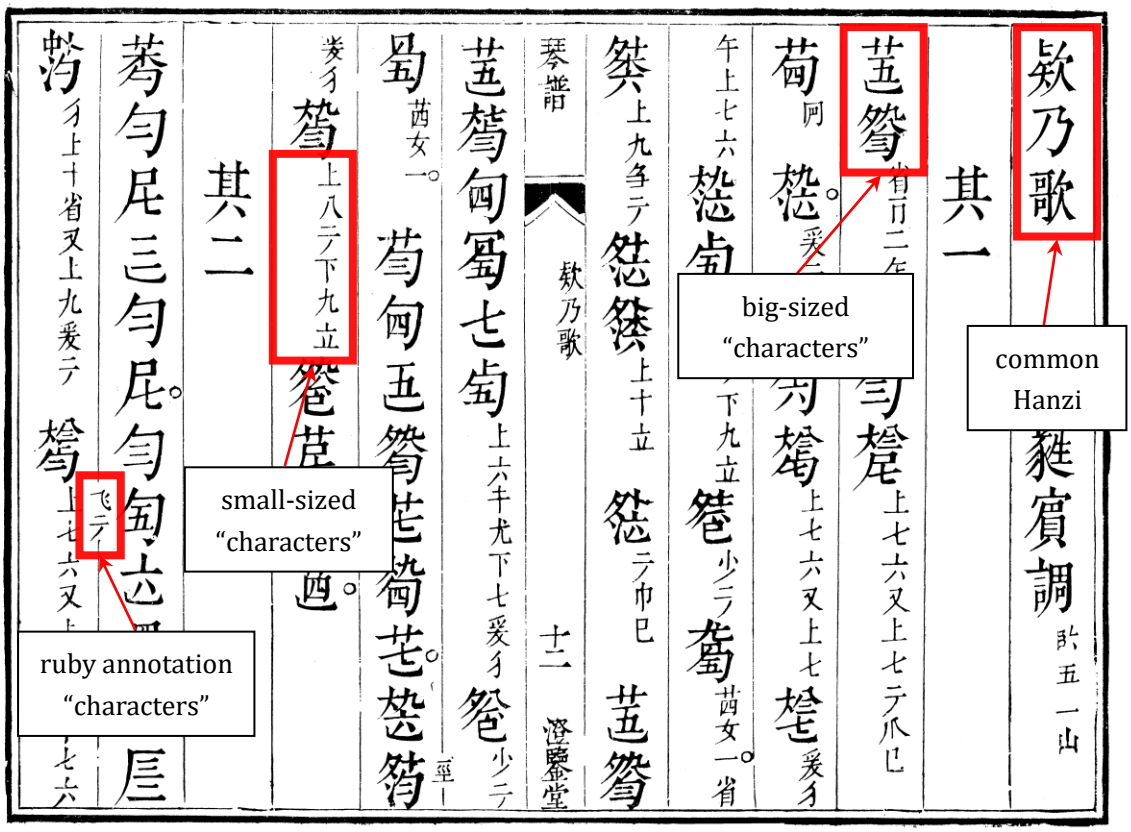


Fig. 2.1.2 Chéngjiàntáng Qínpǔ, Book 5, folio 12

2.2. Fingering letter list

In so many ancient and modern books related to Guqin scores, there is at least one fingering letter list (指法列表) at the beginning of the books. In Fig. 2.2.1, the more big-sized ones in the red squares (“乇”, “尸”) are the ones to record the performance movements of the hands, which looks like the head entry in the page, and the more small-sized ideographic sentences in the red squares (“托也”, “擘也”) show their names in Chinese, which “也” is the classical final particle of identity. There is more detailed introduction in classical literal Chinese under the red squares. These more big-sized ones are called as “字母” for the classical Jianzi usages, which is listed in the blue square. The term “字母” is used to represent the English word “letter” or “alphabet” (see Section 2.4 of GB/T 29633.4-2020) for the modern uses in Chinese language, but this was a traditional phonological term of initial (声母, shēngmǔ) in ancient China, which this term was invented based on Sanskrit and Brahmi script. Please see Figs. 2.2.2 & 2.2.3. The most famous and systematic usage was invented by the Monk Shǒuwēn (守温) who lived in the Posterior Han Dynasty (后汉, not Eastern Han Dynasty) after the Tang Dynasty. The ancient Guqin players inherited and developed this term to represent the elements of their performance movements of the hands. Therefore, we still use the English term “letter” to translate the Chinese term “字母” in this document. Note that the terms “纽/紐” and “声纽/聲紐” had not been inherited in the Guqin uses. The fingering letter in the green square isn’t listed as the more big-sized one or the head entry, but it is also the fingering letter in fact, that means the collection of the head entries can’t cover all the fingering letters we need.

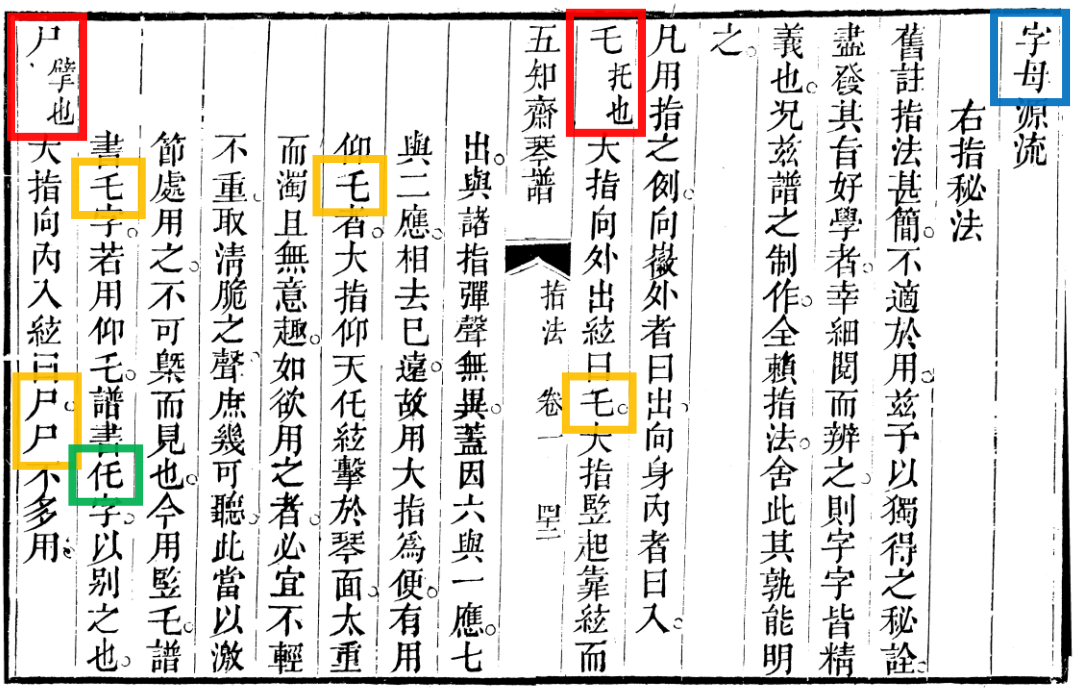

字母源流
右指秘法
舊訂指法甚簡。不適於用。茲予以獨得之秘詮。盡發其旨。好學者幸細閱而辨之。則字字皆精義也。況茲譜之制作。全賴指法。舍此其孰能明之。
凡用指之例。向徽外者曰出。向身內者曰入。
大指向外出絃曰弋。大指豎起靠絃而出。與諸指彈聲無異。蓋因六與一應。七與二應。相去已遠。故用大指爲便。有用而濁且無意趣。如欲用之者。必宜不輕不重。取清脆之聲。庶幾可聽。此當以激節處用之。不可槩而見也。今用豎弋譜書弋字。若用仰弋譜書弋字。以別之也。
大指向內入絃曰尸。尸不多用。
五知齋琴譜 指法 卷一 四二
弋 托也
尸 擘也

Fig. 2.2.1 Wǔzhīzhāi Qínpǔ, Book 2, juan 1, folio 42

2. 关于声母方面的概念

（1）什么叫字母。传统音韵学称声母为字母，又叫声纽，纽。

古人认为声母是一个字音的枢纽，所以称作纽。字母则是根据梵文的体文创立的。

（2）守温三十字母。唐末和尚守温根据梵文体文创立了一套表示汉字声母的字母，共三十个，后人称它作守温三十字母。如下：

唇音	不	芳	並	明
舌音	端	透	定	泥是舌头音
	知	彻	澄	日是舌上音
牙音	见	溪	群	来　疑是牙音
齿音	精	清	从	是齿头音
	审	穿	禅	照是正齿音
喉音	心	邪	晓	是喉中音，清
	匣	喻	影	亦是喉中音，浊

Figs. 2.2.2 & 2.2.3 Tóngděng Xuélì Rényuán Shēnqǐng Shuòshì Xuéwèi Zhōngguó Yǔyán Wénxué Xuékē Zōnghé Shuǐpíng Quánguó Tǒngyī Kǎoshì Dàgāng jí Zhǐnán, pp. 96-97

In general, the fingering letter list in one book should include all the fingering letters used in all the Jianzi scores in the book, but this was not the case. In fact, we met the following situations.

1) So many ancient books collected and inherited the fingering letter lists and different Jianzi scores from different books respectively, so the fingering letter list inherited from an earlier book A can't cover all the fingering letters inherited from the other earlier books B, C and D.

2) Some very old fingering letters listed in the list inherited from an earlier book A, but the corresponding Jianzi score was no longer extant.

3) Some fingering letters should be decomposed as more other fingering letters based on the rationale.

4) Some fingering letters are not listed as the head characters of the entries, please see the one in the green square in Fig. 2.2.1.

5) Some fingering letters were used in a book without a fingering letter list at the beginning.

Therefore, it will not cover all the fingering letters with the clear uses but will collect some fingering letters without the practical uses, if we just merge the lists we meet simply. Mr. Zha Fuxi (查阜西) and Mr. Zhang Zisheng (张子盛) who are both contemporary renowned Guqin performers, have made the great contributions to merge the fingering letter lists and clarify the uses, but we think the repertoires created by them are still not completely suitable for our encoding works. We will reference the useful and helpful parts of their contributions, and we will raise a new repertoire with the clear and suitable uses.

We should also know the fingering letters are also used as part of the ideographic running texts. Please see the orange squares in Fig. 2.2.1, which are the fingering letters with the same shapes of the encoded characters; please also see the orange squares in Fig. 2.2.4, which the two ones on the right are not the same as any encoded characters and have been included in Table 1.1.1.

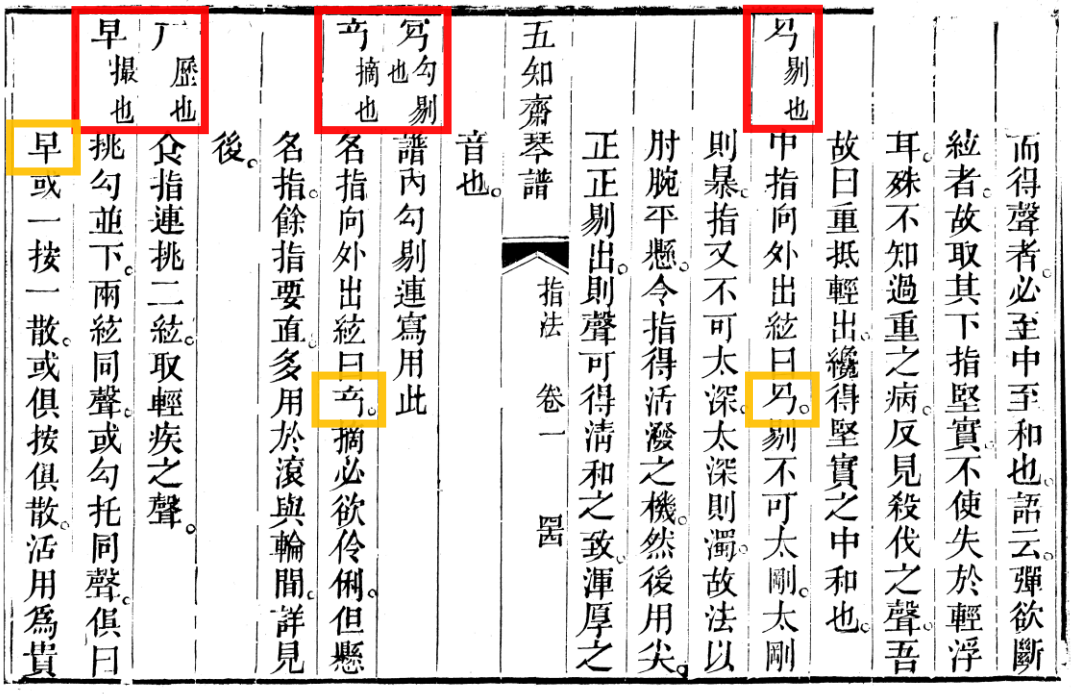
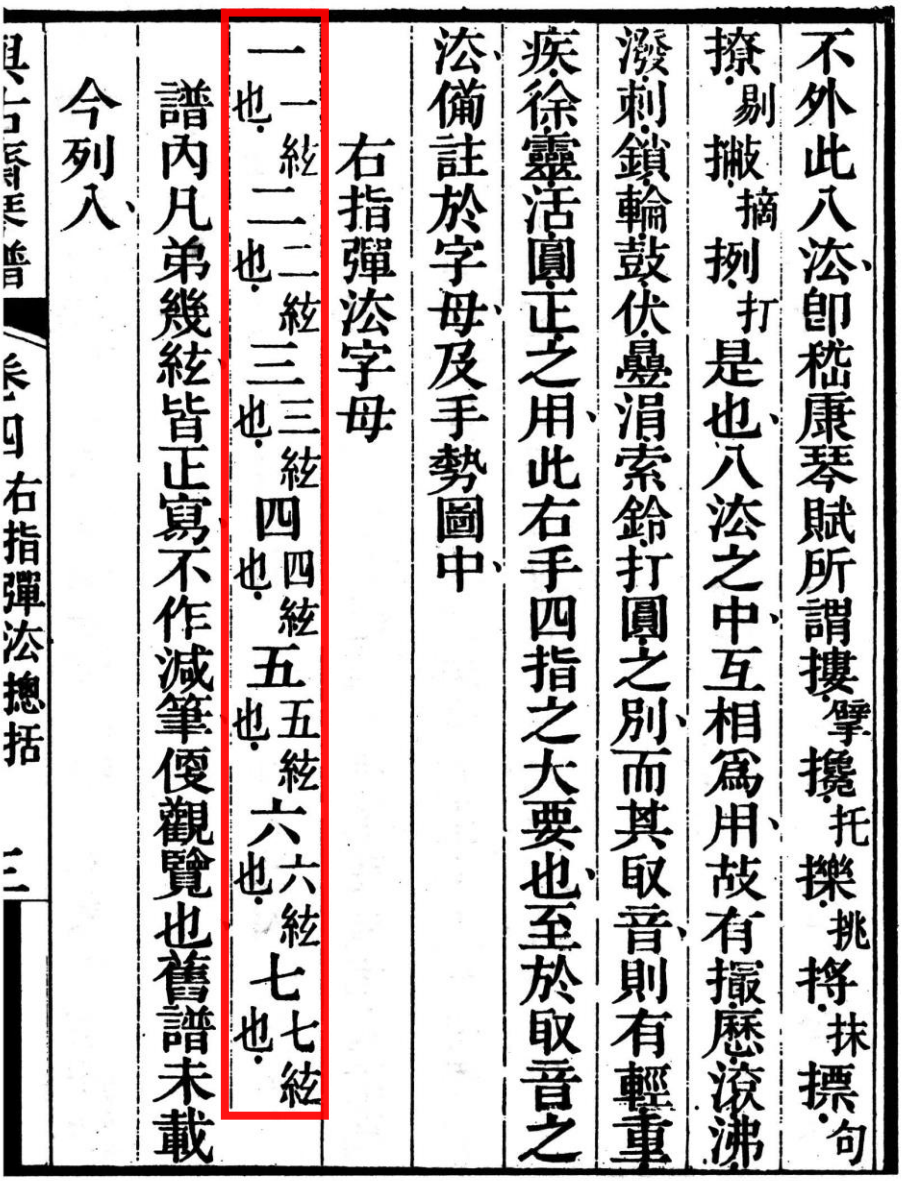


Fig. 2.2.4 Wǔzhīzhāi Qínpǔ, Book 2, juan 1, folio 44

For the pure numerals, the vast majority of books didn't include them as the fingering letters. Now it is impossible for us to know how the authors and editors thought and considered at that time. In the research,

we found there are a small number of books included them as the fingering letters. Fig. 2.2.5 shows the pure numerals used as the strings (弦) in *Yǔgǔzhāi Qínpǔ*, and Fig. 2.5.6 shows them used as the markers (徽). It is easy to know one to seven are all used as the strings and the markers, and the book included them twice based on the different definitions, but we can't encode them twice in UCS and Unicode. Note that the purple square in Fig. 2.5.6 shows complex numerals, but they are only listed here logically, and they will be not used in any score. We won't handle these complex numerals.

There are other books followed the inclusion like *Yǔgǔzhāi Qínpǔ*, such as *Qínxué Rùmén* that inherited the fingering letter list from *Yǔgǔzhāi Qínpǔ* basically. In this document, we treat the pure numerals as a part of the fingering letters for the technical reasons, and we will provide more fingering letters used as the numerals.


不外此八法、卽嵇康琴賦所謂摟擘攙托擽挑捋抹摽句撩剔撇摘捌打是也、八法之中、互相爲用、故有撮歷滾沸潑刺鎖輪鼓伏疊涓索鈴打圓之別、而其取音、則有輕重疾徐靈活圓正之用、此右手四指之大要也、至於取音之法、備註於字母、及手勢圖中、

右指彈法字母

一一絃也、二二絃也、三三絃也、四四絃也、五五絃也、六六絃也、七七絃也、

譜內凡弟幾絃、皆正寫、不作減筆、便觀覽也、舊譜未載今列入、

Fig. 2.2.5 Yǔgǔzhāi Qínpǔ, juan 4, folio 3A

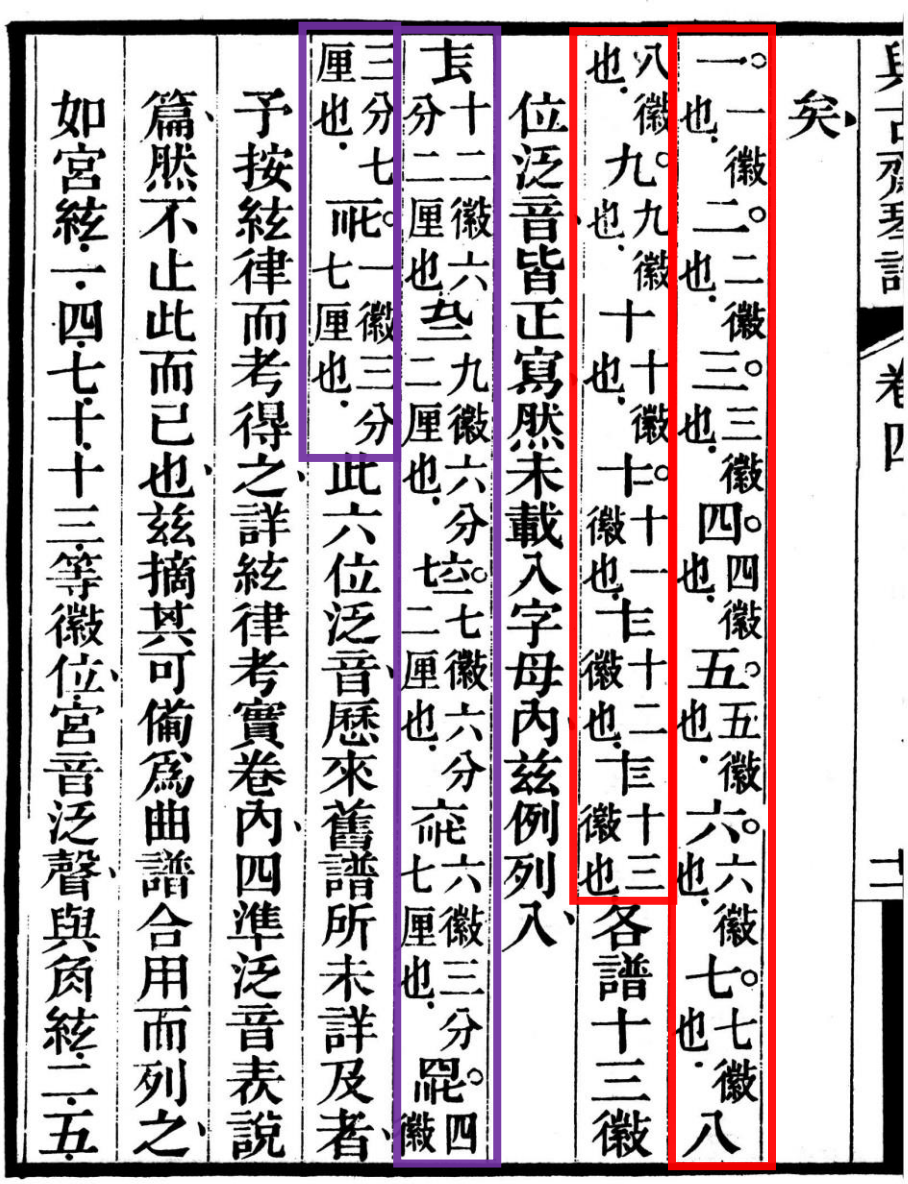


Fig. 2.2.6 Yǔgǔzhāi Qínpǔ, juan 4, folio 11B

2.3. Big-sized "characters"

The big-sized "characters" here means 谱字 (pǔzì) or 大字 (dàzì) in Chinese. We conclude six types of basic structures after comparing tens of thousands of the glyphs for the big-sized "characters" which are collected from more than 50 sets of the ancient and modern books related to Jianzi scores.

2.3.1. Type 1

This is the most common type.

2.3.1.1 Example 1-1

In Fig. 2.3.1.1, we can abstract four kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.1.2.



Fig. 2.3.1.1 Example 1-1

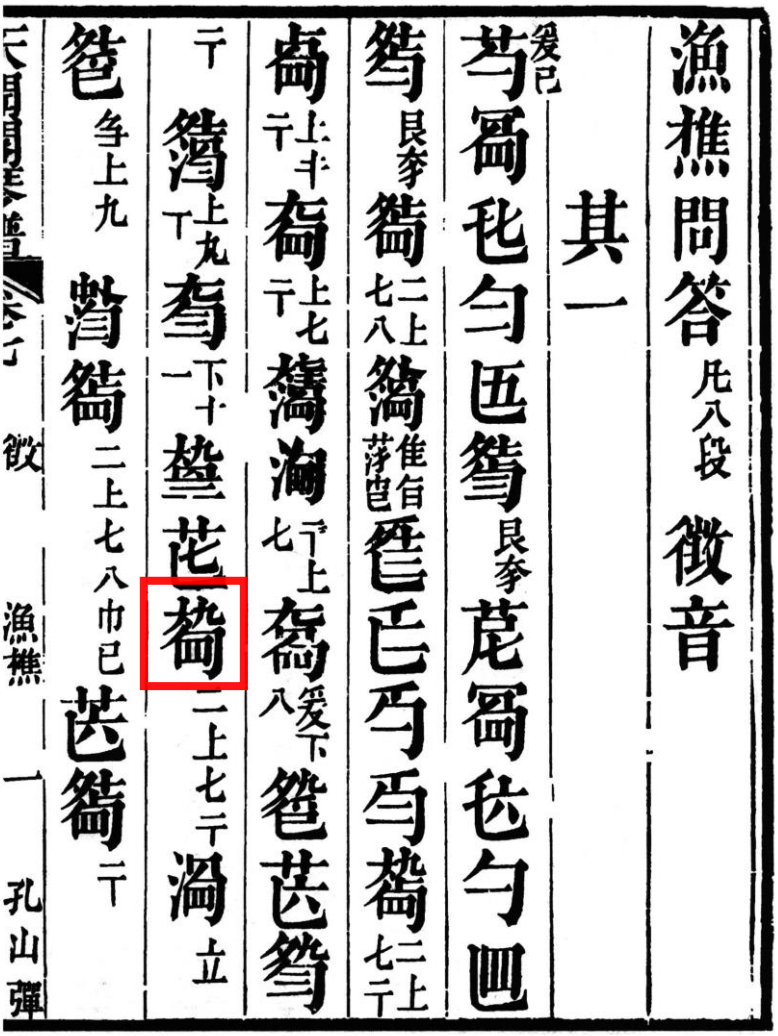


Fig. 2.3.1.2 Tiānwéngé Qínpǔ, juan 7, folio 1

1) The red component at the top left corner means the left-hand finger. In this case, the left-hand finger is 大 “thumb”. This part could be also used other fingering letters like 人/亻 “index finger”, 中 “middle finger”, 夕 “ring finger” and so on. We call this one as “left-hand fingering letter” which is marked as **L**.

2) The green component at the top right corner means the marker. In the panel of Guqin, the length from Yueshan (岳山) to Longyin (龙龈) is called as the effective string length (有效弦长), which should be from 1,120mm to 1,140mm for the modern musical instrument shape basically according to QB/T 4181-2021. Within the effective string length, thirteen markers are set to divide in to fourteen parts, which the bass is on the left, and the high note is on the right, and the seventh marker (七徽) is in the middle. If we need to record the position on the thirteen marker’s left, the marker will be “徽外” (beyond all the markers). In this case, the marker is 九 “the ninth marker”. This part could also use other fingering letters like other pure numerals. We call this one as “marker” which is marked as **M**.

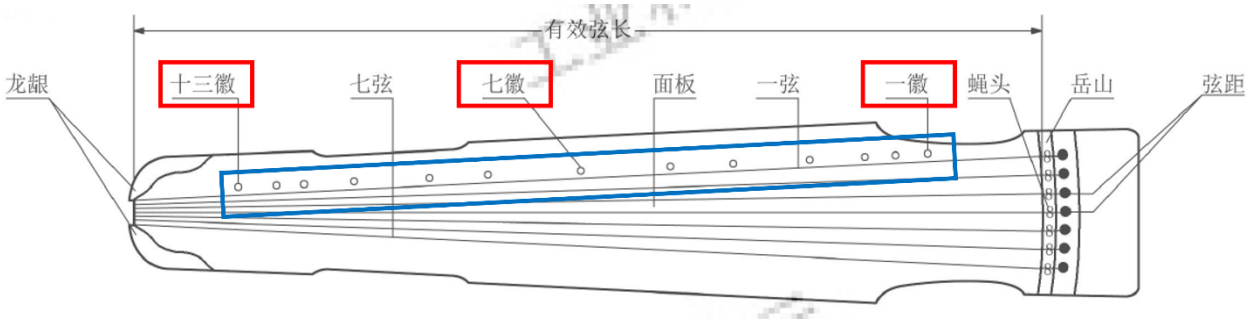
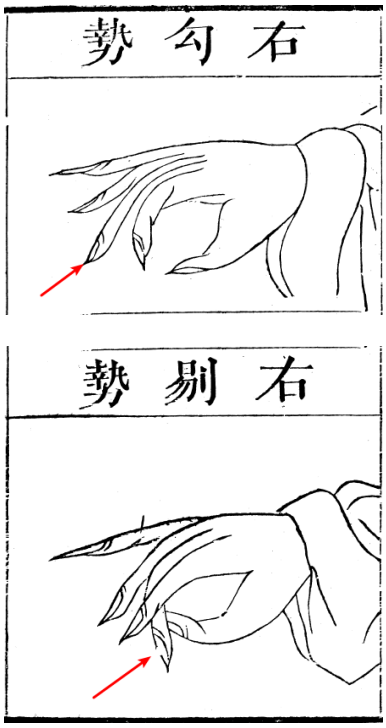


Fig. 2.3.1.3 Markers in the panel of Guqin

(Fig. 1 of QB/T 4181-2021)

3) The blue component at the bottom which also surrounds the orange component means the performance movement of the right-hand fingers. In this case, this one is 勹 that means "勾" "to pluck the string inward with the middle finger". Fig. 2.3.1.4 shows the corresponding gesture. This part could be also used other fingering letter like the unencoded 弓 meant "剔/踢" "to pluck the string outward with the middle finger" as Fig. 2.3.1.5 shows. We call this one as "core fingering letter" which is marked as **C**.



Figs. 2.3.1.4 and 2.3.1.5 Wǔzhīzhāi Qínpǔ, Book 2, juan 1, folio 18

4) The orange component at the inner part of the bottom means the string. Guqin is also called the seven-stringed musical instrument (七弦琴), because there are seven strings in the panel. In this case, the string number is 四 "the fourth string". This part could be also used other string numbers like other pure numerals and so on. We can this one as "string" which is marked as **S**.

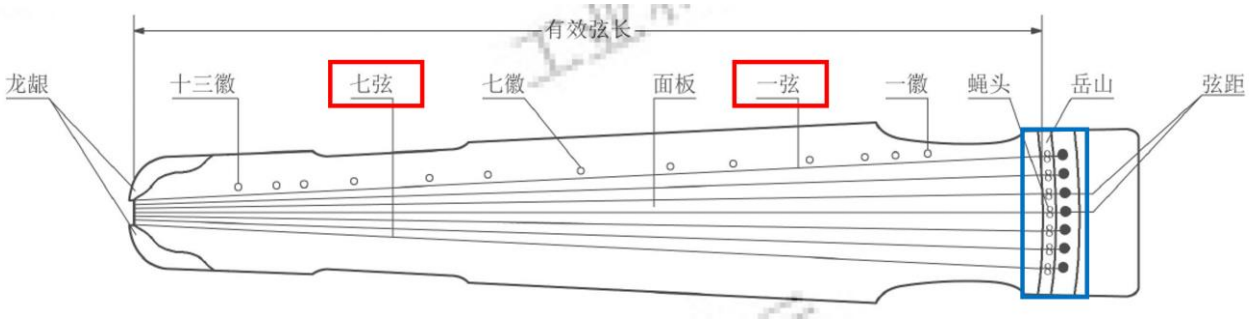


Fig. 2.3.1.6 Strings in the panel of Guqin

(Fig. 1 of QB/T 4181-2021)

2.3.1.2 Example 1-2

Further, we will meet the big-sized “character” like Fig. 2.3.1.7 shows. And we can abstract six kinds of components based on the semantics. Please also see one use case in Fig. 2.3.1.8.



Fig. 2.3.1.7 Example 1-2

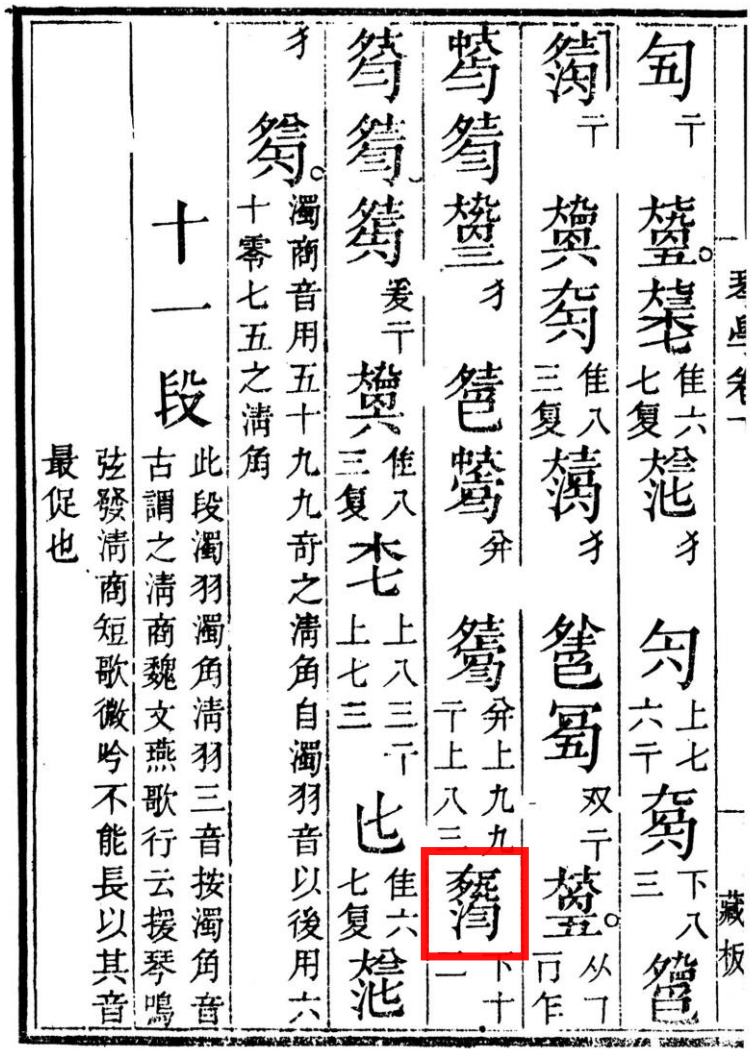


Fig. 2.3.1.8 Yījīnglú Qínxué, Book 2, folio 64B

1) The maroon component at the top means the adverb to modify the core fingering letter here. In this case, this one is 尢 “就” “the left-hand fingering letter or the marker is the same as the previous movement”. This part could be also used as other fingering letters like the unencoded 𠂉 “泛/泛音” “to change the pressing way of the left-hand to make the string shake segmentally to emit the bright and crystal voice of music”. We call this one as “initial fingering letter” which is marked as **I**.

2) The red component at the left of the middle part means the left-hand finger like foregoing 1).

3) The green component at the upper right of the middle part means the marker like foregoing 2).

4) The dark green component at the lower right of the middle part means the sub-marker. In foregoing 2), we have known there are thirteen markers in the panel. In fact, the distance between two markers is also divided into ten parts to make the scales more explicit to reflect the inner activities of the authors and the performers, that is very different from some western musical instruments like Guitar and Ukulele. In this case, the sub-marker is also 九 “the ninth sub-marker”, and that should be regarded as nine and nine-tenths of the distance from the first marker to the thirteenth marker when the ninth marker and the ninth sub-marker are used at the same time. The sub-marker must be used after the marker, which the sub-maker can’t be used independently in this part, that means it must be the marker when there is only one numeral here. This part could also use other fingering letters like other pure numerals less than or equal to ten and so on commonly. We also call this one as “marker” technically, which is marked as **M** as well.

5) The purple component at the lower left corner means the auxiliary annotation of the performance

movement. In this case, the fingering letter is 氵 “注” “to slide to the specified scale from high to low”. This part could use other fingering letters like 卜 “绰” “to slide to the specified scale from low to high” and so on. We call this one as “auxiliary fingering letter” which is marked as **A**.

6) The blue component at the lower right which also surrounds the orange component means the performance movement of the right-hand fingers same as foregoing 3).

7) The orange component at the inner part of the lower right means the string like forgoing 4).

To sum up, Type 1 means there is one and only one core fingering letter in the sequence, and other elements can be lacking. The special situation is that the core fingering letter could be ibid omitted visually when it is the same as the previous performance movement of the right hand.

2.3.2. Type 2

The uses of this type are relatively limited in all the Jianzi scores.

2.3.2.1 Example 2-1

In Fig. 2.3.2.1, we can abstract five kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.2.2. Fig. 2.3.2.2 shows it is cited from another book, so we show the book it meant as Fig. 2.3.2.3.



Fig. 2.3.2.1 Example 2-1

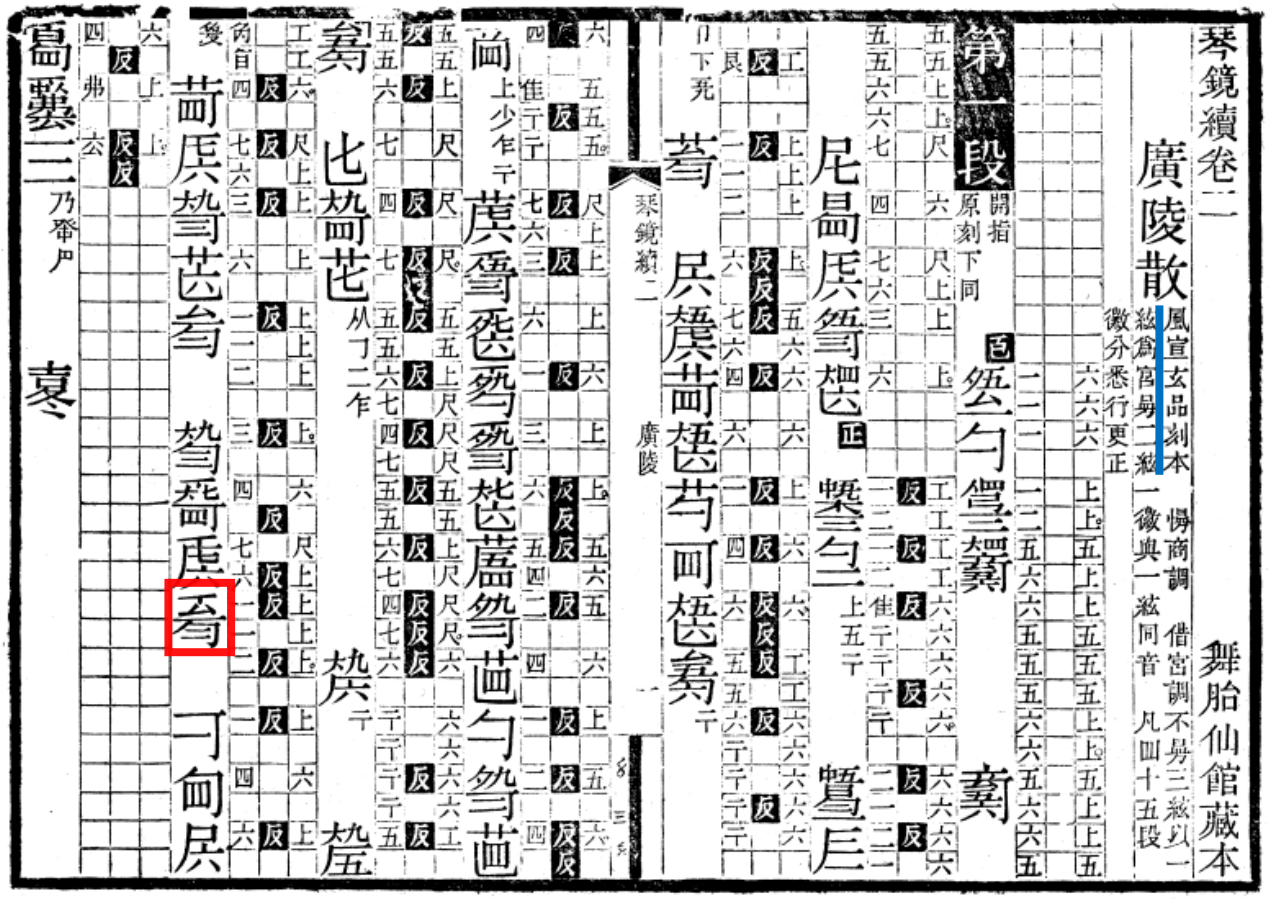


Fig. 2.3.2.2 Qínxué Cóngshū: Qínjìng Xù, Book 13, juan 2, folio 1

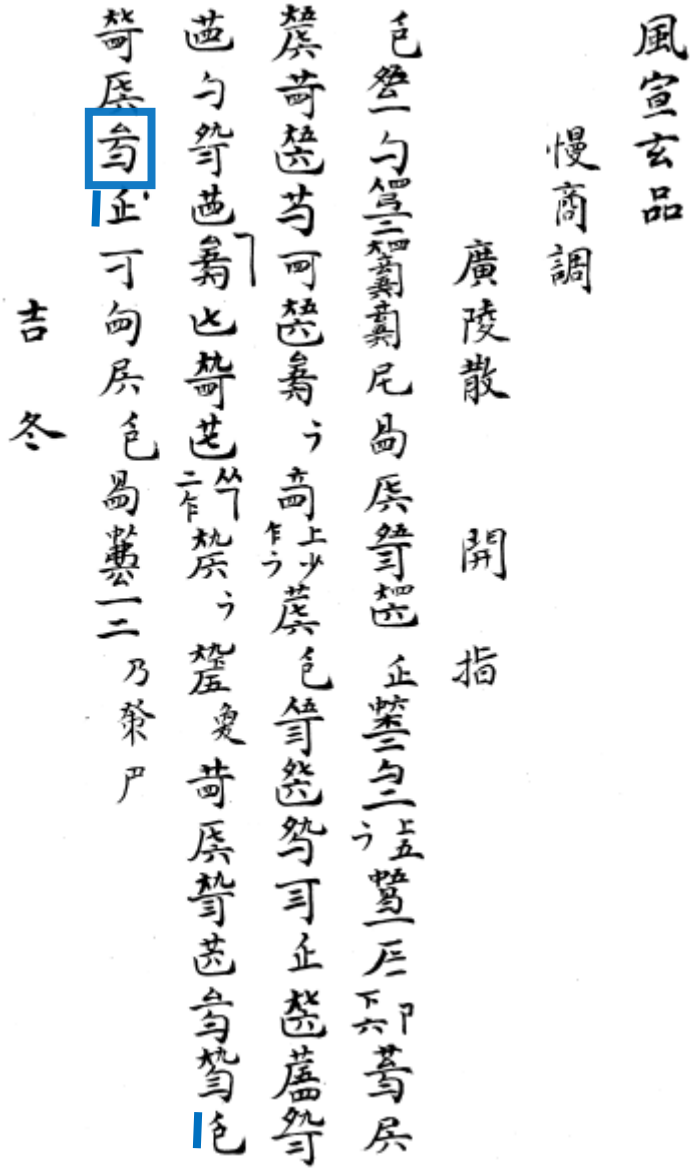


Fig. 2.3.2.3 Fēngxuān Xuánpǐn, Book 6, juan 5, folio 1

1) The maroon component at the top means the adverb to modify the core fingering letter here like 1) of Example 1-2. Note that the recording method of this performance movement in Fig. 2.3.2.3 is different from the one in Fig. 2.3.2.2 but with the same meaning. The performance movement(s) of any big-sized "character" between 乜 "泛起" and 丷 "泛止" means the initial fingering letter(s) should be 𠂉 "泛/泛音" "to change the pressing way of the left-hand to make the string shake segmentally to emit the bright and crystal voice of music". 乜 "泛起" and 丷 "泛止" could be analogized to Shift-in (移入) and Shift-out (移出) as the shift functions in ISO/IEC 2022 encoding structure for performance movements of several big-sized "characters", so other big-sized "characters" outside the range which is included by 乜 "泛起" and 丷 "泛止" should be kept the performance movement as-is; 𠂉 "泛/泛音" could be analogized to Single-shift (单移) as the shift functions, so it just affect only one big-sized "character".

2) The blue component which is the second one from top to bottom means the performance movement of the right-hand fingers like 3) of Example 1-1. In this case, the fingering letter is 𠆢 that means "蠲" "to pluck two adjacent strings inward with the index finger and the middle finger continuously". This is the core fingering letter.

3) The orange component which is the third one from top to bottom means the string like 4) of Example 1-1.

4) The dark blue component at the bottom which also surrounds the tiger orange component also means the performance movement of the right-hand fingers same as 3) of Example 1-1. This is also the core fingering letter.
5) The tiger orange component at the inner part of the bottom also means the string 4) of Example 1-1.

2.3.2.2 Example 2-2

In Fig. 2.3.2.4, we can abstract six kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.2.5. Fig. 2.3.2.5 means the different part of the same music score of Fig. 2.3.2.2, so we show the corresponding part of another book as Fig. 2.3.2.6.



Fig. 2.3.2.4 Example 2-2

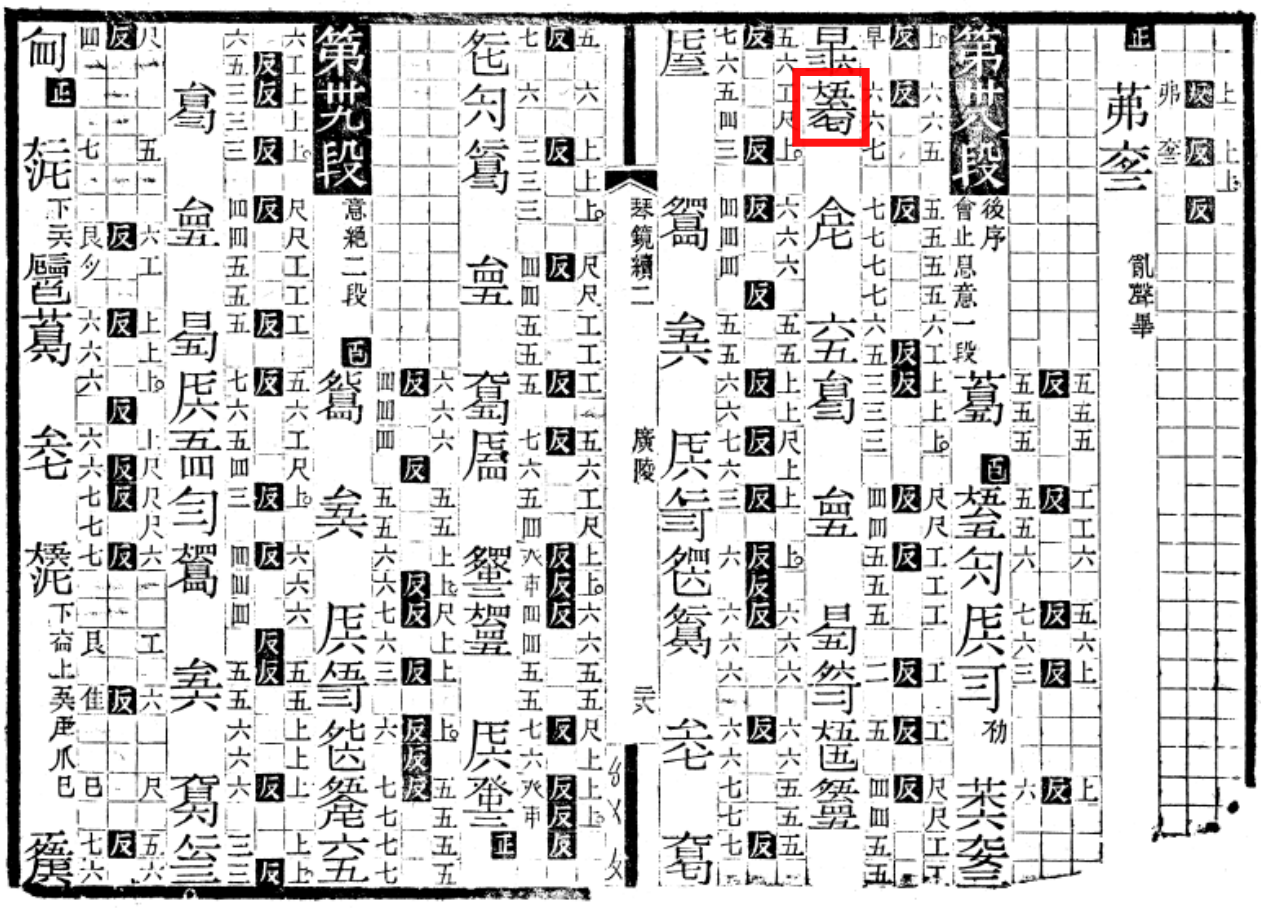


Fig. 2.3.2.5 Qínxué Cóngshū: Qínjìng Xù, Book 13, juan 2, folio 28

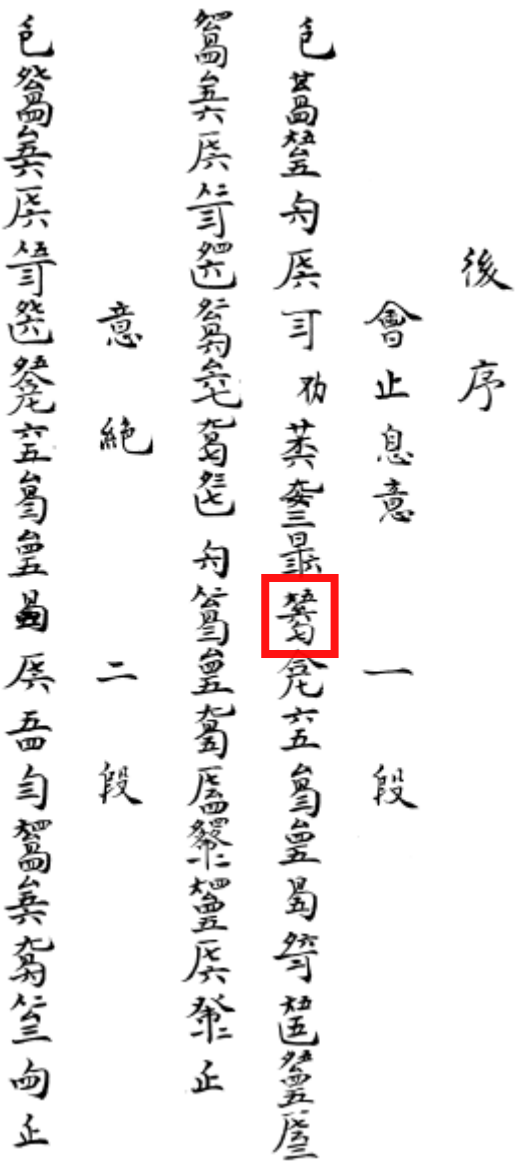


Fig. 2.3.2.6 Fēngxuān Xuánpǐn, Book 6, juan 5, folio 9

1) & 2) The red and green components are like 1) and 2) of Example 1-1.

3), 4), 5) & 6) The blue, orange, dark blue and tiger orange components are like 2), 3), 4) and 5) of Example 2-1. There are two core fingering letters here as well.

To sum up, Type 2 means there are two and only two core fingering letters in the sequence, and other elements can be lacking. The special situation is that the core fingering letters could be ibid omitted when it is the same as the previous performance movement of the right hand.

2.3.3. Type 3

The uses of this type are also common.

2.3.3.1. Example 3-1

In Fig. 2.3.3.1, we can abstract eight kinds of elements based on the semantics. Please also see one use case

in Fig. 2.3.3.2.



Fig. 2.3.3.1 Example 3-1

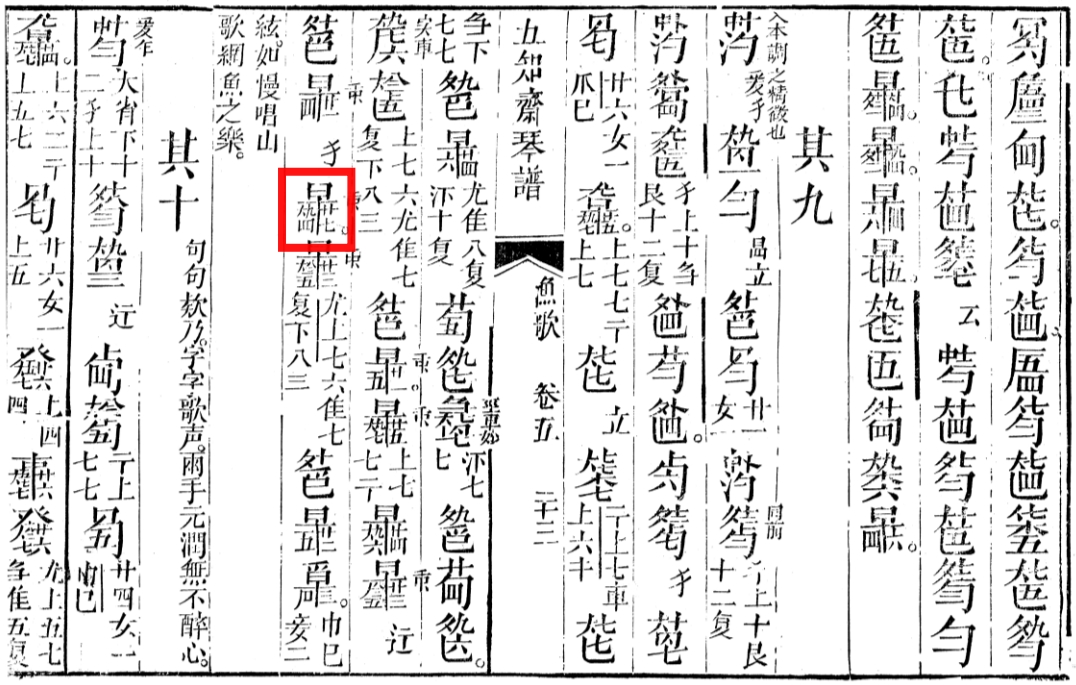


Fig. 2.3.3.2 Wǔzhīzhāi Qínpǔ, Book 4, juan 5, folio 23

1) The sky-blue component at the top, which the end of its tail also drop to the bottom, means the instruction of two continuous performance movements. In this case, this one is 早 that means “撮” “to pluck two or more strings with different right-hand fingering letters at the same time”. This part could be also used as other fingering letters like 尺 that means “拨” “to pluck two or more strings inward with the index finger, middle finger and ring finger to get one sound”, 申 that means “刺” “to pluck two or more strings outward with the index finger, middle finger and ring finger to get one sound”, and so on. This is a core fingering letter. Note that this one can’t be ibid omitted visually in this type.

2) & 3) The red and green components are like 1) and 2) of Example 1-1.

4) There is one omitted fingering letter between the green and orange components in order. This is also a core fingering letter.

5) The orange component means the string like 4) of Example 1-1.

6) The daffodil purple component at the top of the lower right means the auxiliary annotation of the performance movement. In this case, this one is 廾 that means “散” “the left hand doesn’t press any marker”. When 廾 “散” is used, the left-hand fingering letters and the marker(s) would not be used at the same time.

7) There is also one omitted fingering letter between the daffodil purple and tiger orange components in order. This is still a core fingering letter.

8) The tiger orange component also means the string like 4) of Example 1-1.

2.3.3.2. Example 3-2

In Fig. 2.3.3.3, we can abstract eight kinds of elements based on the semantics like Example 3-1. Please also see one use case in Fig. 2.3.3.4.



Fig. 2.3.3.3 Example 3-2

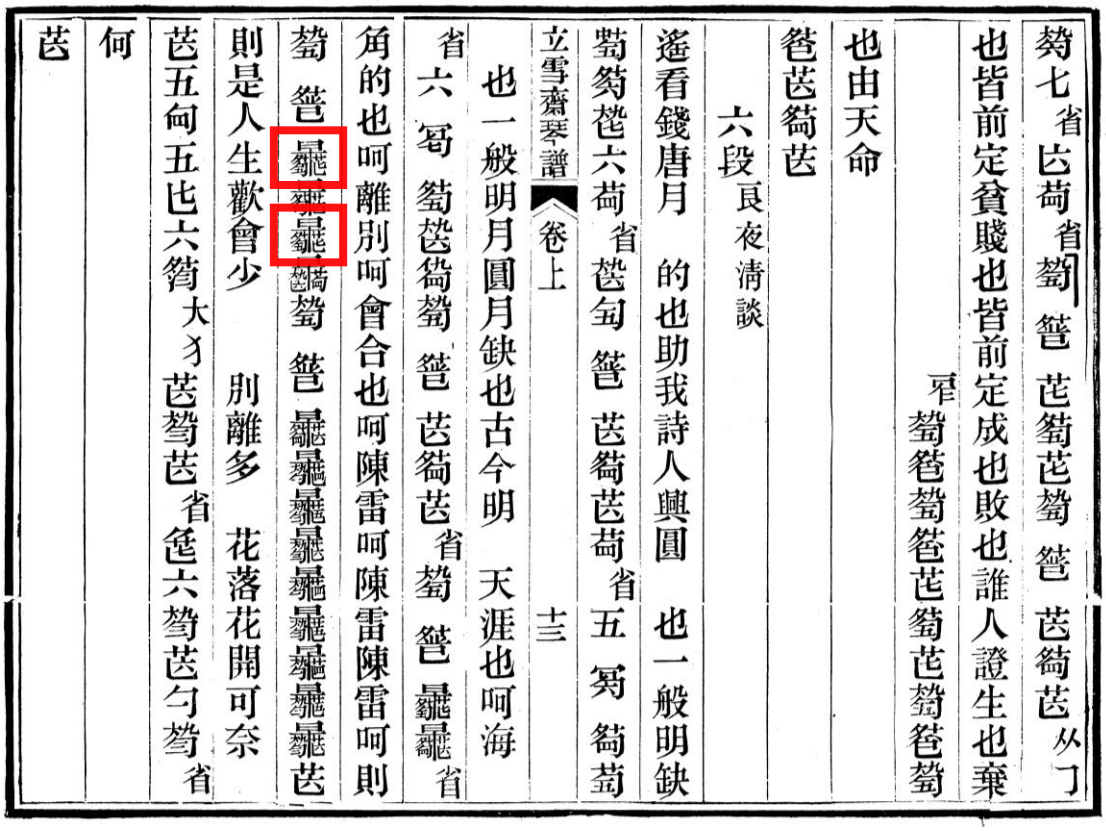


Fig. 2.3.3.4 Lìxuězhāi Qínpǔ, juan A, folio 13

1), 2) & 3) The sky-blue, red and green components are like 1), 2) and 3) of Example 3-1.

4) The blue component at the bottom of the lower left, which also surrounds the orange component means the performance movement of the right-hand fingers as the same as 3) of Example 1-1. This is not omitted here, and it is also a core fingering letter.

5) & 6) The orange and daffodil purple components are like 5) and 6) of Example 3-1.

7) The dark blue component at the bottom of the lower right, which also surrounds the tiger orange component also means the performance movement of the right-hand fingers like 3) of Example 1-1. This is not omitted here. In this case, this one is 乚 that means “挑” “to pluck the string outward with the index finger”. This is still a core fingering letter.

8) The tiger orange component is like 8) of Example 3-1.

To sum up, Type 3 means there are three and only three core fingering letters in the sequence, and other elements can be lacking. The special situation is that the second and third core fingering letters could be ibid

omitted when it is the same as the previous performance movement of the right hand, but the first one can't.

2.3.4. Type 4

This is a further simplified form of Type 3, and the final quantity is very limited.

2.3.4.1. Example 4-1

In Fig. 2.3.4.1, we can abstract three kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.4.2.



Fig. 2.3.4.1 Example 4-1

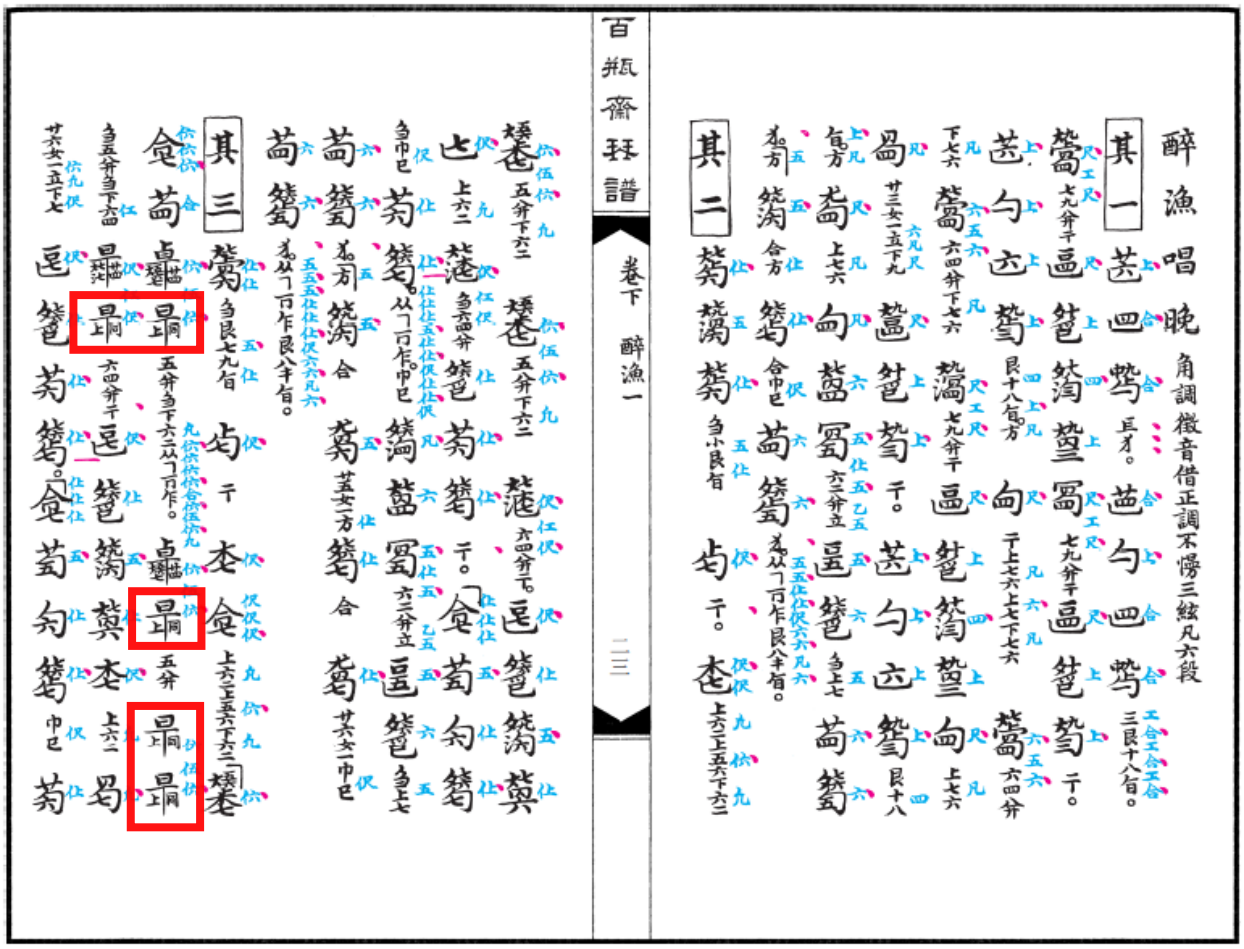


Fig. 2.3.4.2 Bǎipíngzhāi Qínpǔ, juan B, folio 23

1) The sky-blue component is the same as 1) of Example 3-1.

2) & 3) The deep pink and indigo components are only used as 同 and 上 that means "ditto" together. For the big-sized "character" mentioned in Fig. 2.3.4.2 at the right of the first red rectangle, the lower left part should be 大指五徽六分绰七弦 (𠄡) as the same as the previous big-sized "character", and the lower right part should be 散四弦 (𠀤) as the same as the previous big-sized "character"; for the one mentioned in Fig.

2.3.4.2 at the right of the first red rectangle, the lower left part should be 大指七徽注七弦 (𢀖) as the same as the previous big-sized "character", and the lower right part should be still 散四弦 (𠀤) as the same as the previous big-sized "character". The default order of these two elements is right-to-left, which is different from other types. We call these ones as "other fingering letter" which is marked as **O**.

2.3.4.2. Example 4-2

In Fig. 2.3.4.3, we can abstract three kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.4.4.



Fig. 2.3.4.3 Example 4-2

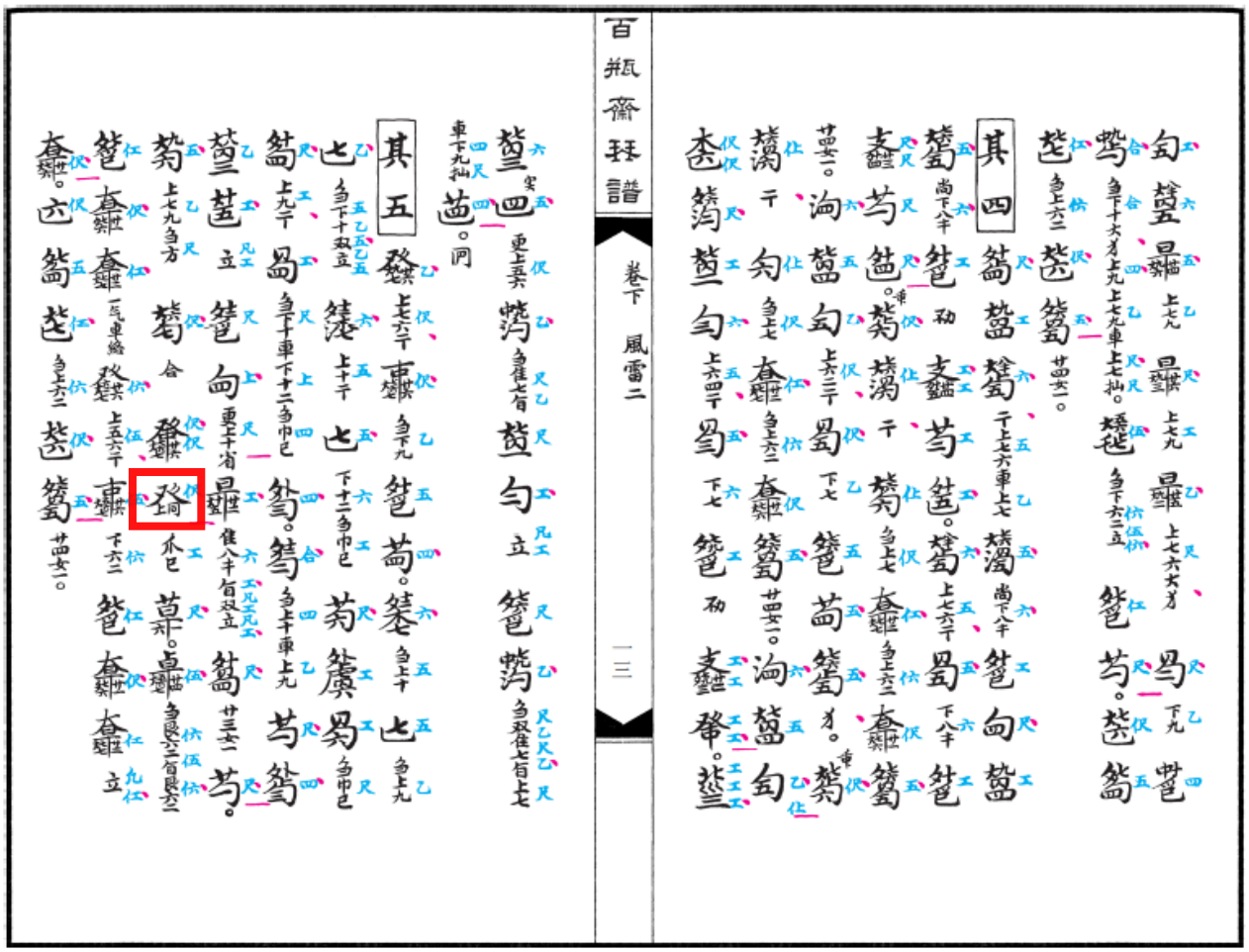


Fig. 2.3.4.4 Bǎipíngzhāi Qínpǔ, juan B, folio 13

1) The sky-blue component is like 1) of Example 4-1.

2) & 3) The deep pink and indigo components are the same as 2) & 3) of Example 4-1. For the big-sized "character" mentioned in Fig. 2.3.4.2 at the right of the first red rectangle, the lower left part should be 大指七徽六分七弦 (𢀖) as the same as the previous big-sized "character", and the lower right part should be 散六弦 (𠀤) as the same as the previous big-sized "character".

To sum up, Type 4 means there are one and only one core fingering letter in the sequence and it must be used after one Type 3 big-sized “character”, that the core fingering letter is the same as the first one of Type 3, and the other fingering characters are limited to only two elements, which the ordering is stable. All the fingering letters could not be ibid omitted.

2.3.5. Type 5

This type is not more common than Type 1 and Type 3.

2.3.5.1. Example 5-1

In Fig. 2.3.5.1, we can abstract six kinds of elements based on the semantics. Please also see one use case in Fig. 2.3.5.2.



Fig. 2.3.5.1 Example 5-1

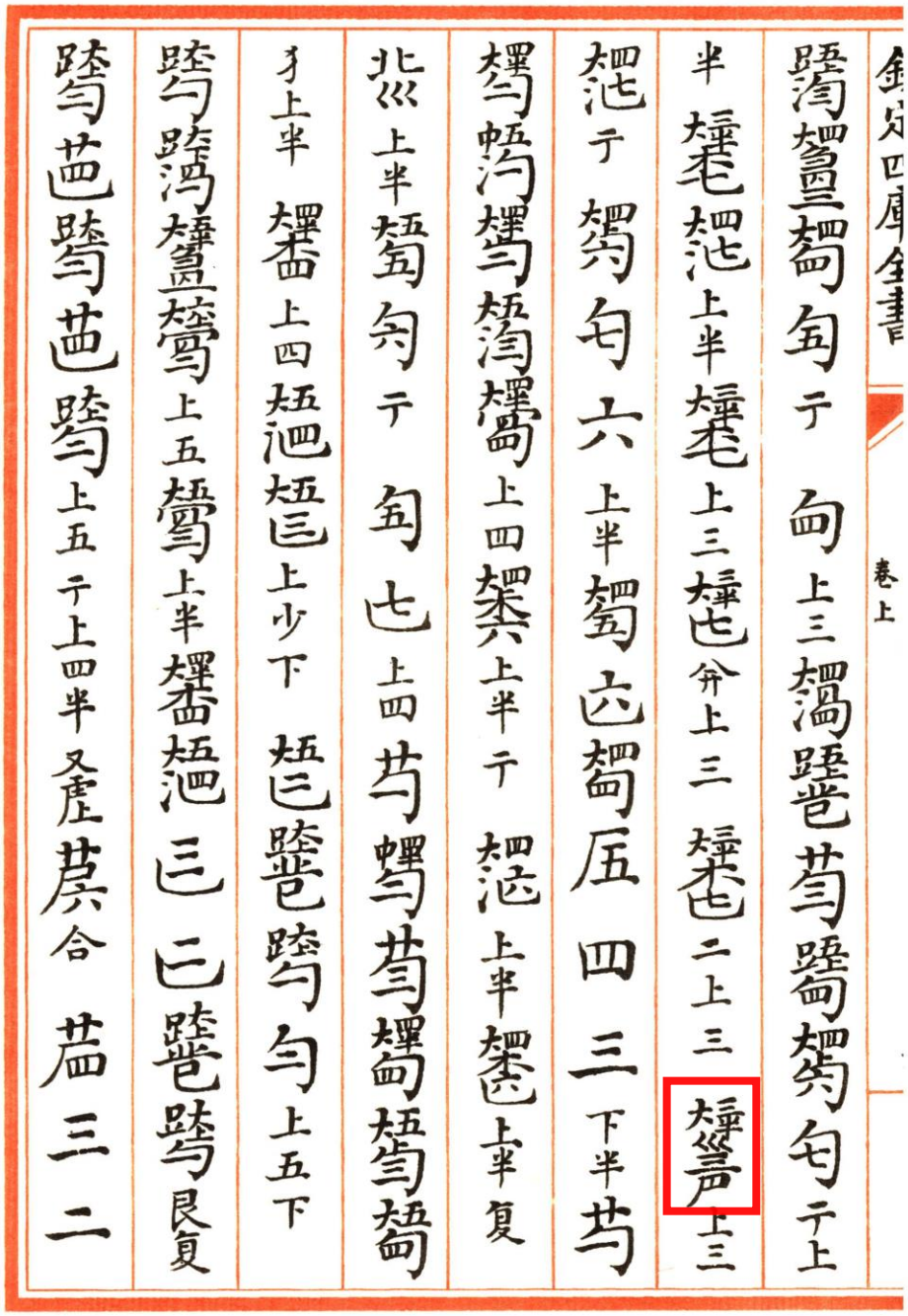


Fig. 2.3.5.2 Wényuāngé Sìkù Quánshū Běn: Sōngxiánguǎn Qínpǔ, juan A, folio 6B

1) The red component is the same as 1) of Example 1-1.

2) & 3) The green and the dark green components are like 2) and 3) of Example 1-2. In this case, the sub-marker 半 means "half the distance between two markers", which the shape of the form is the same as the corresponding fingering letter name "半".

4) The blue component in the middle is like 3) of Example 1-1. In this case, this one is 巛 that means "锁" "to pluck the same string inward with the index finger, outward with the index finger, inward with the middle finger and outward with the middle finger four times tightly and continuously". This is the core fingering letter.

5) The chocolate component in the lower middle means the times of the sounds. It is also the pure numerals, but the range is different from the pure numerals used for marker and string. In this case, this one is 三 that means "三" "three times". It could also be used as other pure numerals or numeral sequences. We call it as

"times" which is marked as **N**.

6) The dark grey component at the bottom means the sound and there is only one element which could be used here. The only one element is 尸 that means "声" "the sound". We call it as "tail" which is marked as **T**. Note that the "tail" could also be used as the elements of Types 1 and 3 as well.

2.3.5.2. Examples 5-2-1 to 5-2-6

There are six examples in this sub-section. In Fig. 2.3.5.3, we can abstract three kinds of elements based on the semantics. For Examples 5-2-1 to 5-2-3, there are three elements and two visible components; for Examples 5-2-4 to 5-2-6, there are four elements and three visible components. Please also see the use cases in Figs. 2.3.5.4 through 2.3.5.7. Example 5-2-6 is in Fig. 2.3.5.4, example 5-2-3 is in Fig. 2.3.5.5, examples 5-2-1 and 5-2-4 are in Fig. 2.3.5.6, examples 5-2-2 and 5-2-5 are in Fig. 2.3.5.7. Note that there are a similar one in the blue box of Fig. 2.3.5.4, but the author showed it as the small-sized form, so we ignore it at this step.

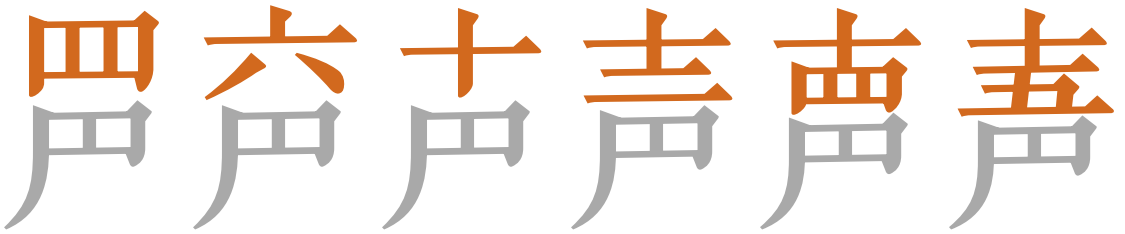


Fig. 2.3.5.3 Examples 5-2-1 to 5-2-6

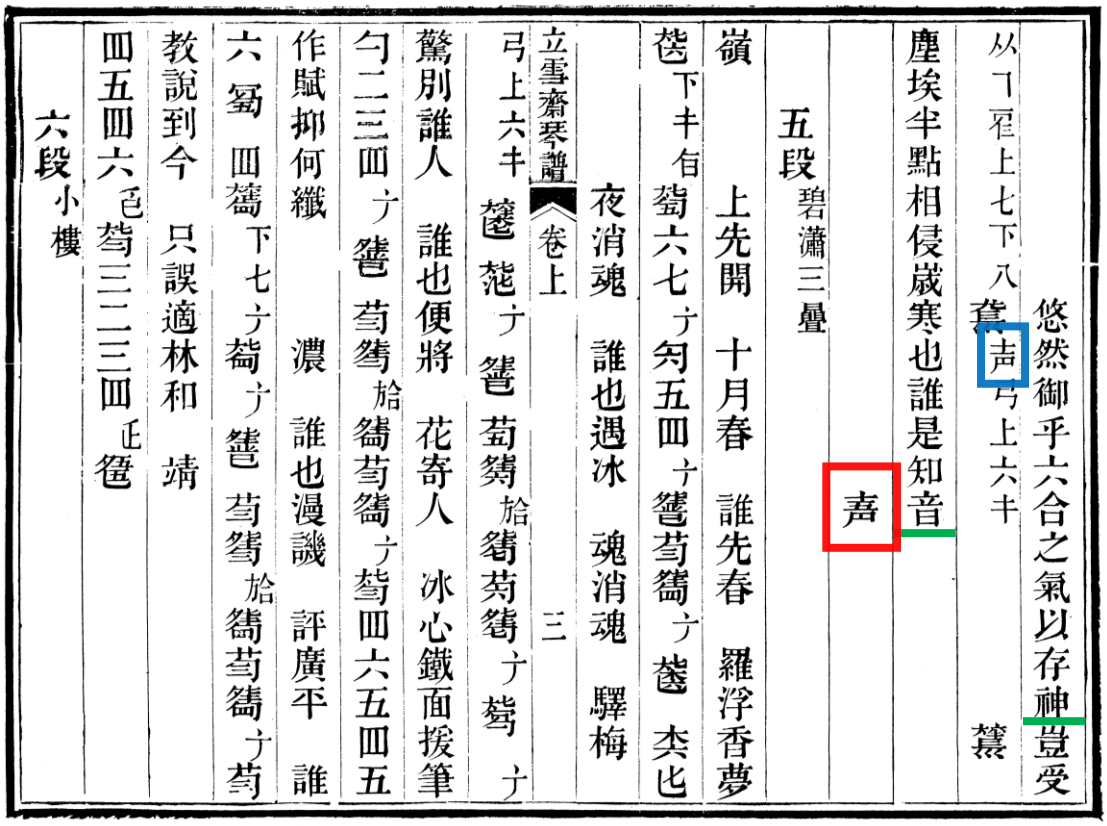


Fig. 2.3.5.4 Lìxuězhāi Qínpǔ, juan A, folio 3

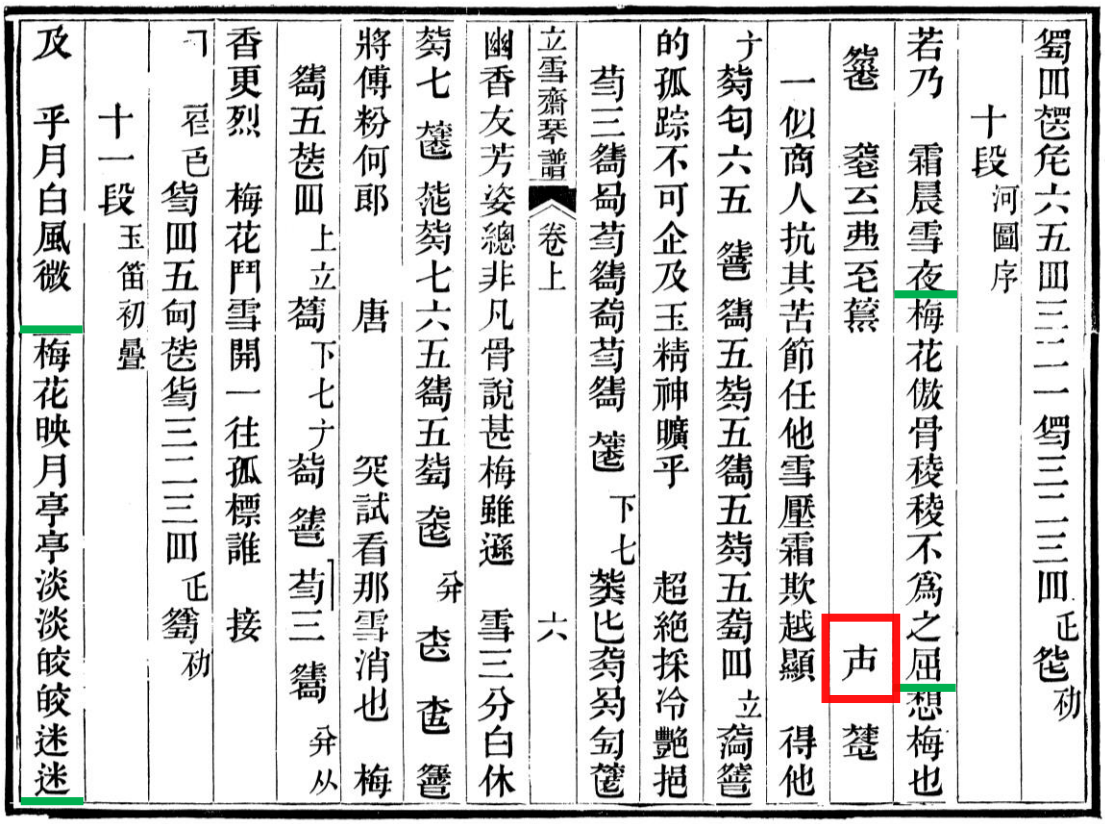


Fig. 2.3.5.5 Lìxuězhāi Qínpǔ, juan A, folio 6

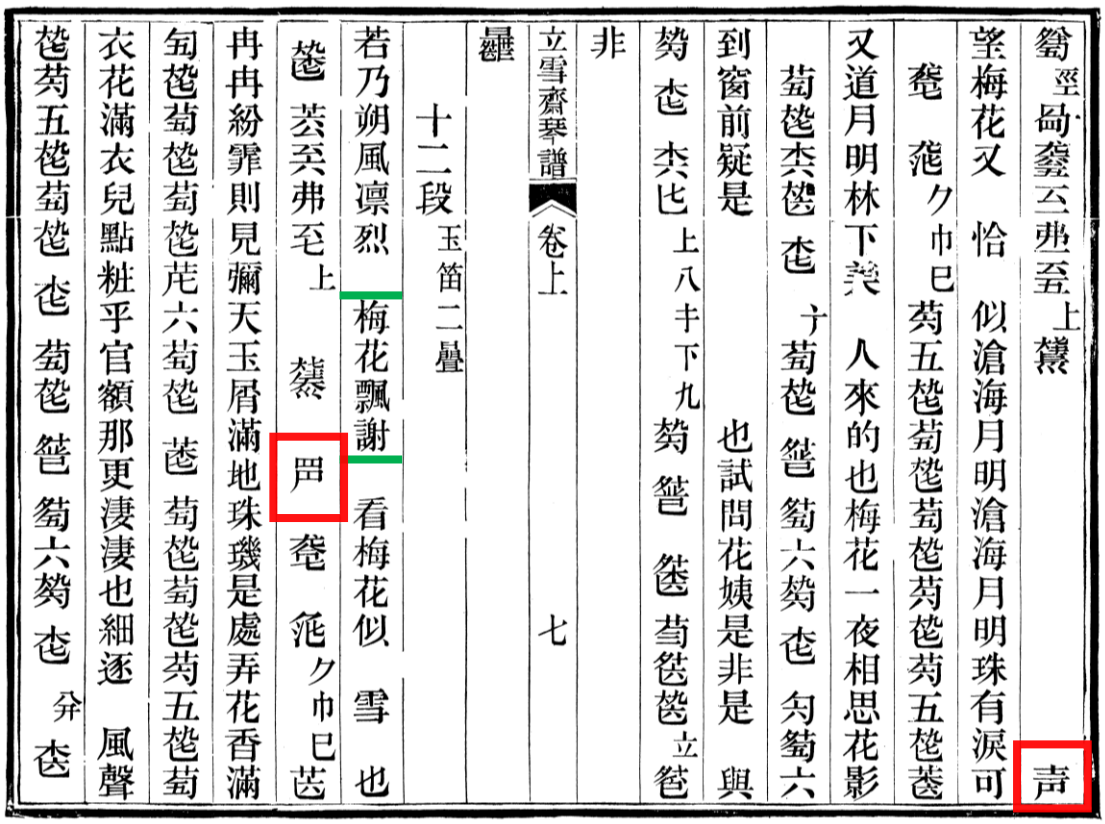


Fig. 2.3.5.6 Lìxuězhāi Qínpǔ, juan A, folio 7

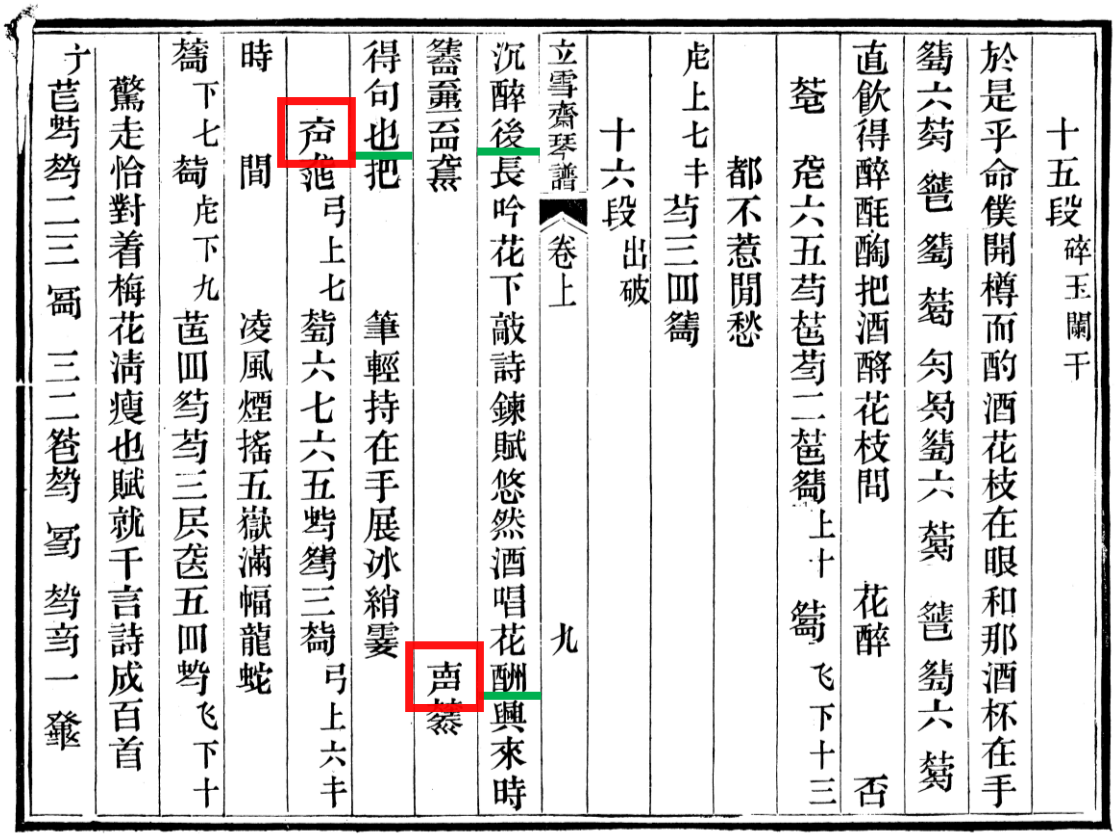

十五段 碎玉闌干
於是乎命僕開樽而酌酒花枝在眼和那酒杯在手
蒭六芶 𦉢 蒭 蒭 勻 芶 蒭六 蒭 𦉢 蒭六 蒭
直飲得醉酕醄把酒酹花枝問 花醉 否
菴 庬六五芍苣芍二苣蒭上十 蒭 飞下十三
都不惹閒愁
虍上七丰 芍三皿蒭
十六段 出破
立雪齋琴譜 卷上 九
沉醉後長吟花下敲詩鍊賦悠然酒唱花酬興來時
𥳑𠀠𠀠𥳑 声𥳑
得句也把 筆輕持在手展冰綃霎
声𥳑 弓上七 蒭六七六五𠯑𠯑三蒭 弓上六丰
時 間 凌風煙搖五嶽滿幅龍蛇
蒭下七 蒭 虍下九 苣皿芍芍三戾𠀠五皿𠯑 飞下十
驚走恰對着梅花清瘦也賦就千言詩成百首
亍苣𠯑𠯑二三 𠯑 三二𦉢𠯑 𠯑 𠯑𠯑一 𦉢

Fig. 2.3.5.7 Lìxuězhāi Qínpǔ, juan A, folio 9

1) There is one omitted element before the (first) chocolate component. As Figs 2.3.5.4 through 2.3.5.7 show, the core fingering letters of the previous big-sized "characters" are 𠯑 "长锁" or 𠯑 "短锁", which the omitted core fingering letter should inherit them. 𠯑 "长锁" and 𠯑 "短锁" are different kinds of 巛 "锁" we mentioned above.

2) The chocolate component at the top means the times of the sounds, which is like 5) of Example 5-1. There is only one pure numeral for Examples 5-2-1 to 5-2-3, and there are only two pure numerals for Examples 5-2-4 to 5-4-6. The corresponding Chinese morphemes of the lyric of Example 5-2-1 in Fig. 2.3.5.6 are "梅花飄謝" (4 characters), the ones of Example 5-2-2 in Fig. 2.3.5.7 are "興來時(，)得句也(。)" (6 characters), the ones of Example 5-2-3 in Fig. 2.3.5.5 are "梅花(，)傲骨稜稜(，)不爲之屈(。)" (10 characters), the ones of Example 5-2-4 in Figs. 2.3.5.5 and 2.3.5.6 are "梅花映月(，)亭亭淡淡(，)皎皎迷迷(。)" (12 characters), the ones of Example 5-2-5 in Fig. 2.3.5.7 are "長吟花下(，)敲詩鍊賦(。)悠然酒唱花酬(。)" (14 characters), the ones of Example 5-2-6 in Fig. 2.3.5.4 are "豈受塵埃半點相侵(？)歲寒也(。)誰是知音(？)" (15 characters). The counting rule follows the common rule of Chinese numerals.

3) The dark grey component at the bottom is like 6) of Example 5-1.

2.3.5.3. Examples 5-3-1 to 5-3-4

There are four examples in this sub-section, and let's see three of them first. In Fig. 2.3.5.8, we can abstract four kinds of elements for all these examples based on the semantics. Example 5-3-1 is used commonly, and so many fingering letter lists include it as a possible fingering letter, but it is better to treat it as not an independent fingering letter after reviewing more Jianzi scores. If we treat Example 5-3-1 as an independent fingering letter, the most obvious question we need to meet is if it is suitable to encoding the following three separately, even more, as the independent fingering letters. The answer is obviously NO. Please also see the use cases in Figs. 2.3.5.9 through 2.3.5.11. Example 5-3-1 is in Fig. 2.3.5.9, Example 5-3-2 is in Fig. 2.3.5.11,

Example 5-3-3 is in Fig. 2.3.5.10.



Fig. 2.3.5.8 Examples 5-3-1 to 5-3-3

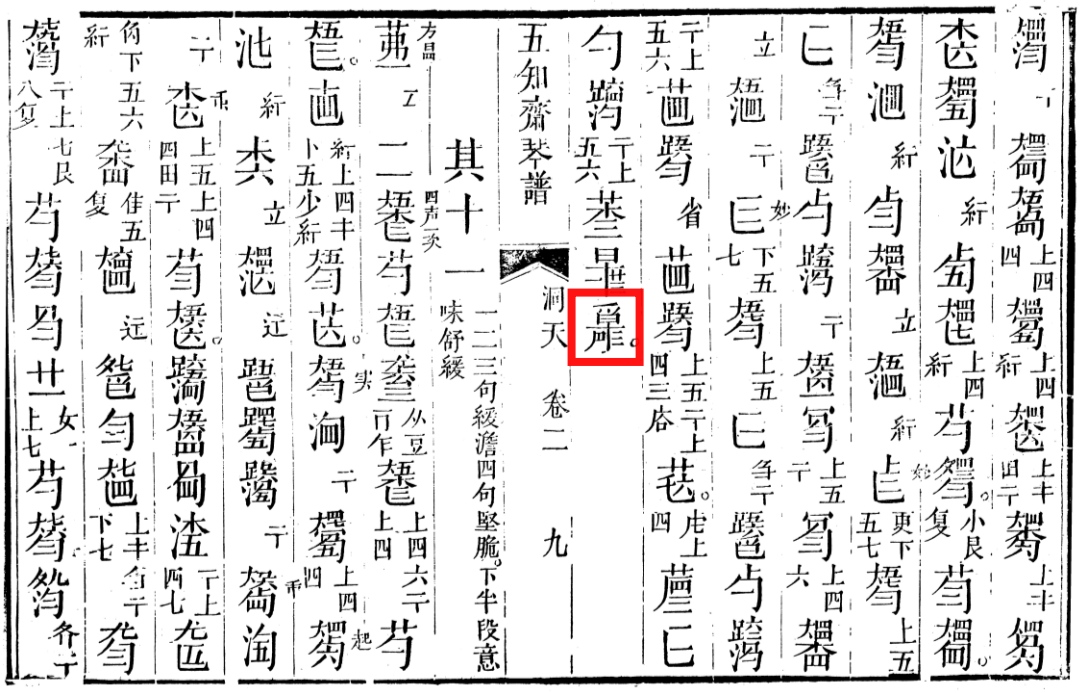


Fig. 2.3.5.9 Wǔzhīzhāi Qínpǔ, Book 3, juan 2, folio 9

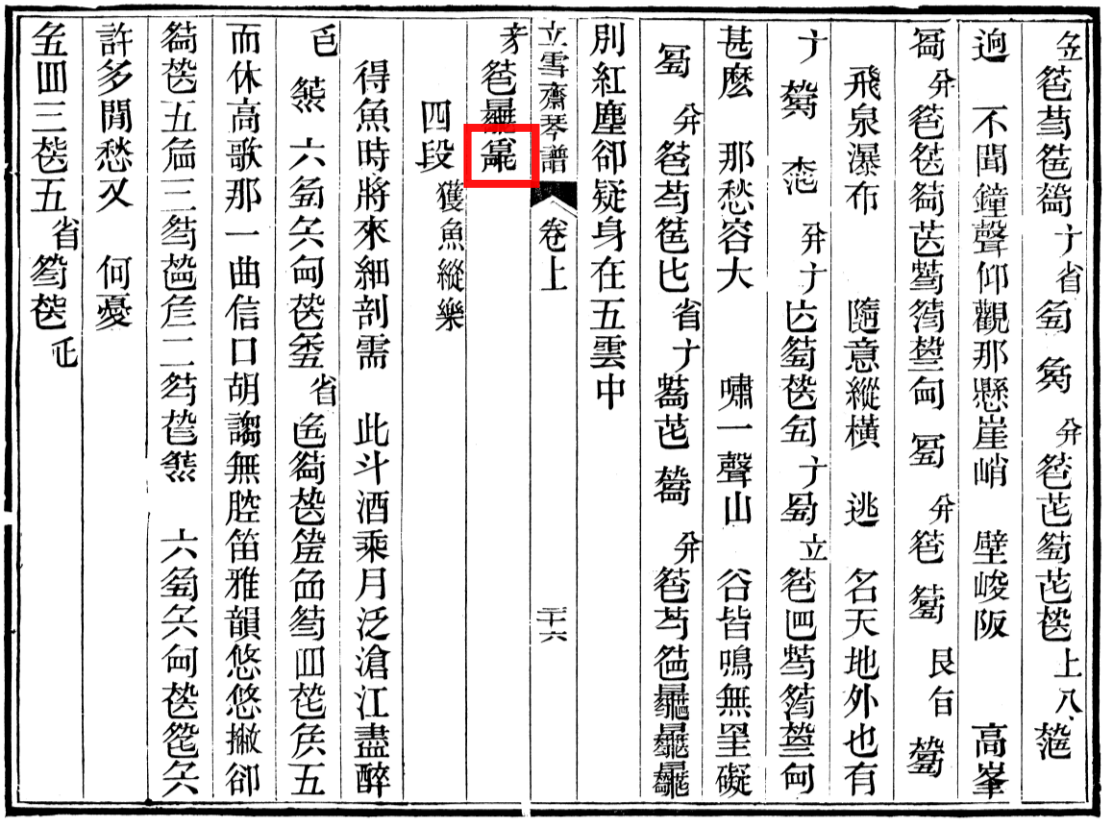


Fig. 2.3.5.10 Lìxuězhāi Qínpǔ, juan A, folio 26

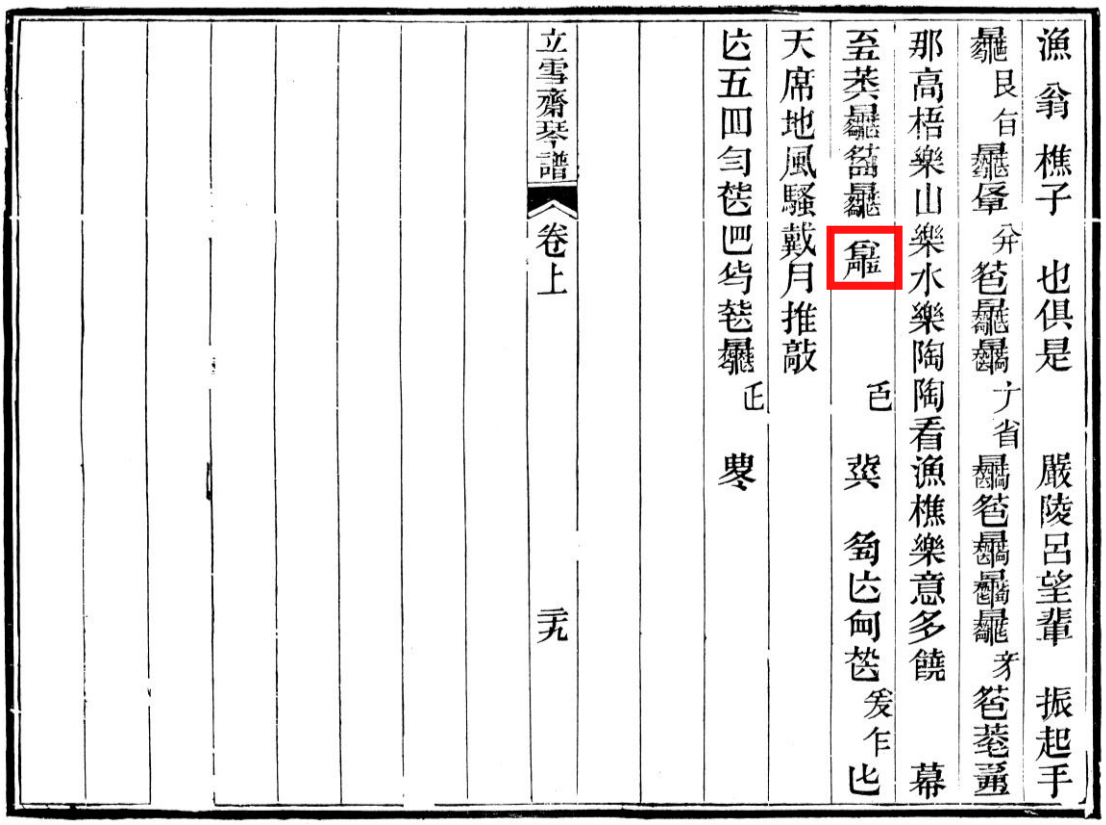


Fig. 2.3.5.11 Lìxuězhāi Qínpǔ, juan A, folio 29

1) The purple component at the top means the auxiliary annotation of the performance movement like 5) of

Example 1-2. In these cases, this one is 𠂇 that means "掐" "one string is pressed by the middle or ring finger of the left hand, and the thumb pluck the string to the inside of the palm of the hand softly to emit one sound". Eiso once mentioned this fingering letter in Section 6.4 of IRGN2429R, and Việt Nam NB submitted the UNC proposal (IRGN2434=L2/20-210) to disunify V0-3D5B from U+722B (爫), and IRG finally accepted to move V0-3D5B to U+2B735 (𠂇) and current V-Source reference for U+722B (爫) is VN-0722B. In the meantime, Eiso had a long discussion with Lee and Prof. Nhàn on the related issues.

2) The blue component is the same as 1) of Example 3-1. This is the core fingering letter.

3) & 4) The chocolate and dark grey components are like 5) and 6) of Example 5-1. We need to know the location of these two components in the bodies could be interchanged sometimes. As Fig. 2.3.5.12 shows, Examples 5-3-1 and 5-3-4 are totally the same. Please compare Figs. 2.3.5.9 and 2.3.5.13, they mean the same position of the same score in different books.

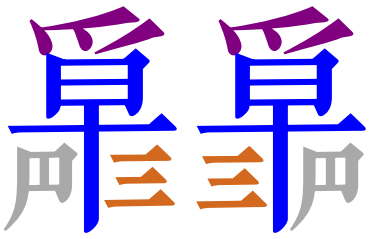


Fig. 2.3.5.12 Examples 5-3-1 & 5-3-4

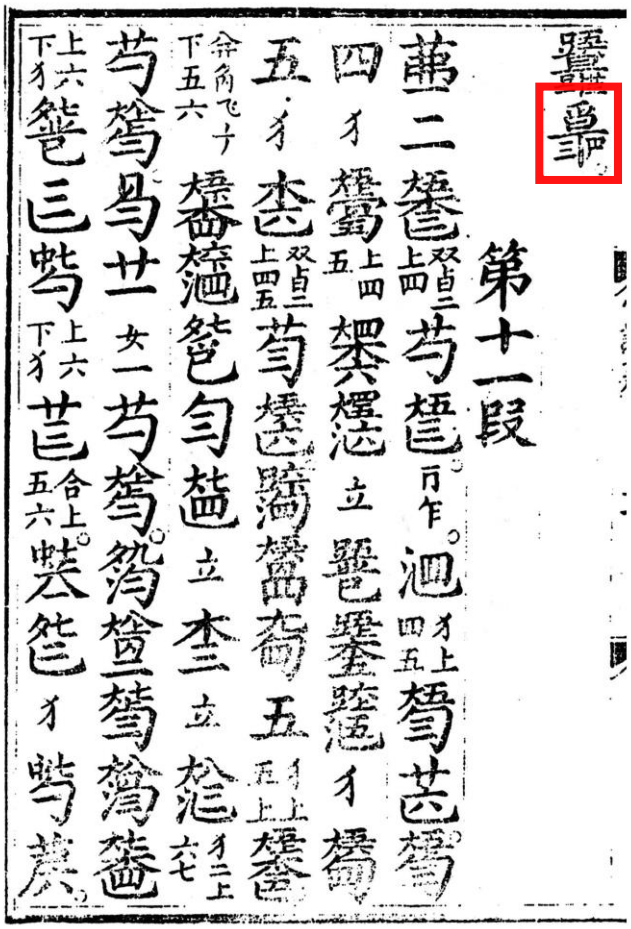


Fig. 2.3.5.13 Cángchūnwù Qínpǔ, Book 1, folio 9A

Similar to 2) of 2.3.5.2, the corresponding Chinese morphemes of the lyric of Example 5-3-2 in Fig. 2.3.5.11 are "樂水樂陶陶" (5 characters), the one of Example 5-3-3 in Fig. 2.3.5.10 are "卻疑身在五雲中" (7

characters).

To sum up, Type 5 is very similar to Type 1, but the last element of Type 5 must be 尸, and 尸 will not be included in Type 1 forever. The range of numerals before 尸 are also different from the range of strings.

2.3.6. Type 6

This type is totally different from the above types. Based on the basic rationale, the results could be infinite logically, but we found the possibilities of the actual uses are very limited. In Fig. 2.3.6.1, we can abstract two kinds of elements for each example based on the semantics. Please also see the use cases in Fig. 2.3.6.5. Figs. 2.3.6.2 through 2.3.6.4 and 2.3.6.6 are the pictures related to analyzations.



Fig. 2.3.6.1 Examples 6-1 to 6-4

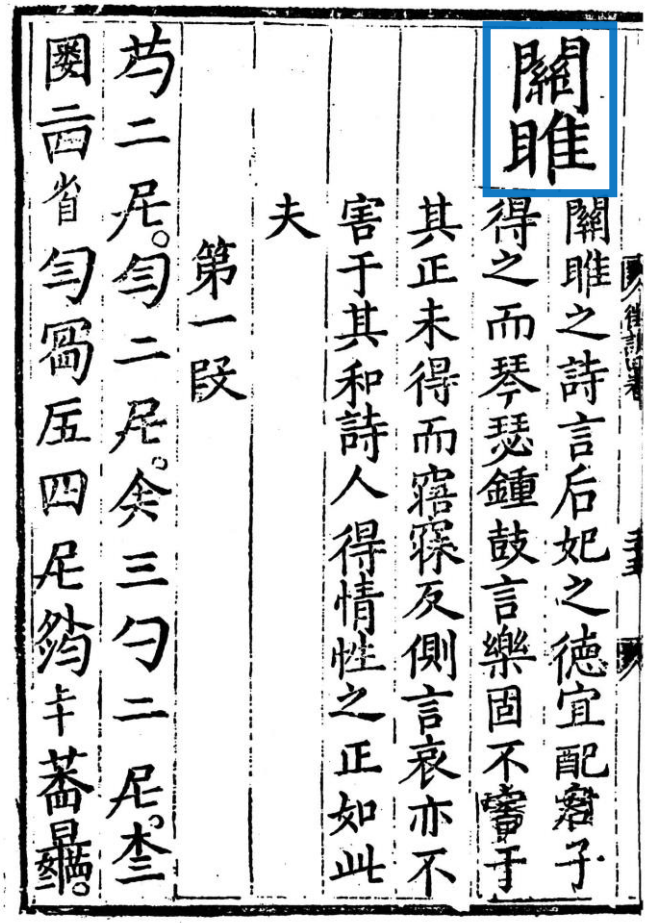


Fig. 2.3.6.2 Cángchūnwù Qínpǔ, Book 4, folio 25B

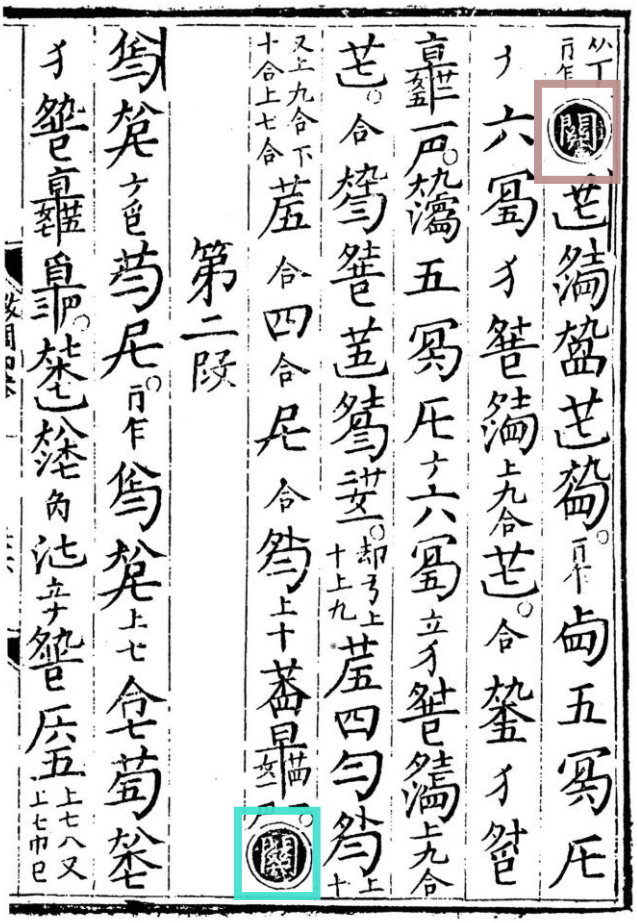


Fig. 2.3.6.3 Cángchūnwù Qínpǔ, Book 4, folio 26A

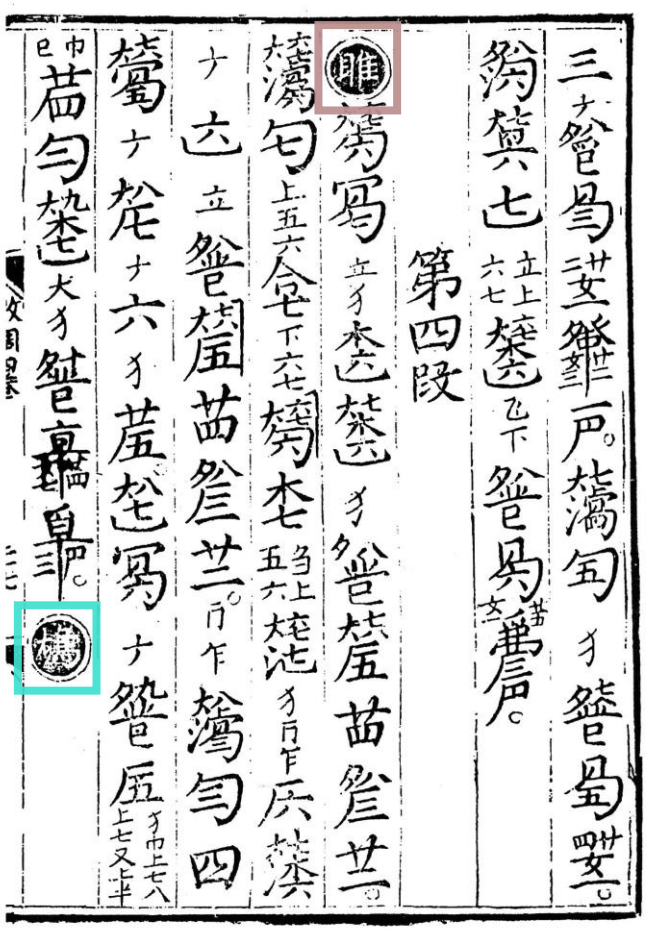


Fig. 2.3.6.4 Cángchūnwù Qínpǔ, Book 4, folio 27A

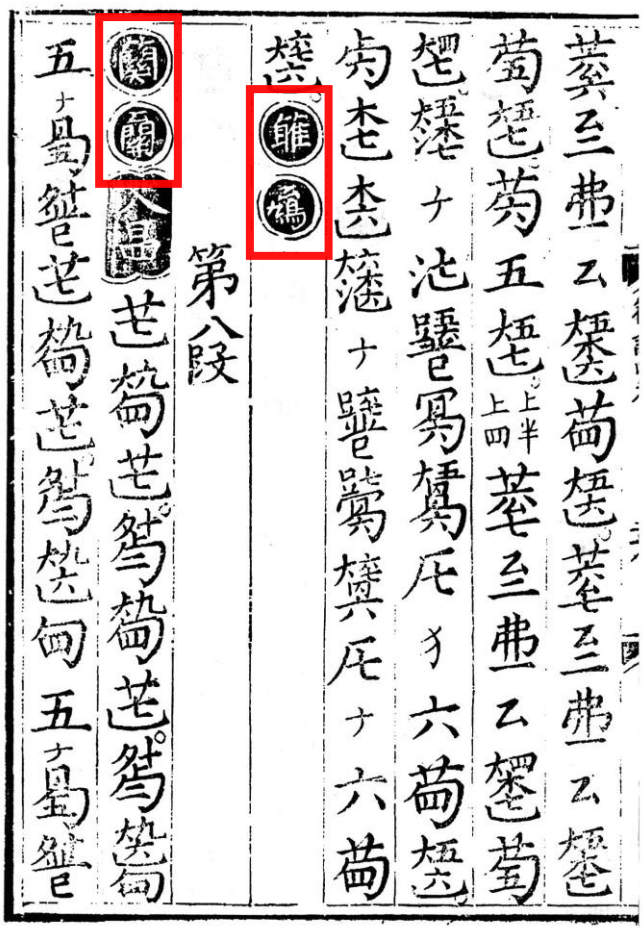


Fig. 2.3.6.5 Cángchūnwù Qínpǔ, Book 4, folio 28B

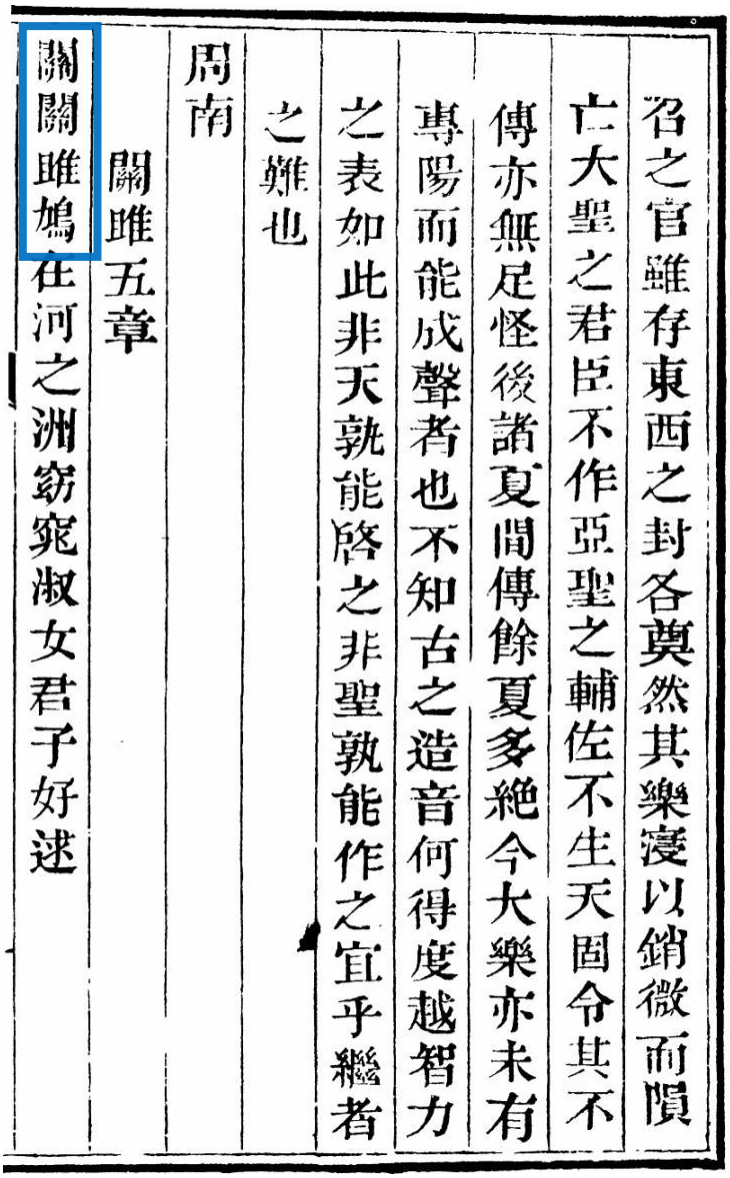

召之官雖存東西之封各奠然其樂寢以銷微而隕
亡大聖之君臣不作亞聖之輔佐不生天固令其不
傳亦無足怪後諸夏間傳餘夏多絶今大樂亦未有
專陽而能成聲者也不知古之造音何得度越智力
之表如此非天孰能啓之非聖孰能作之宜乎繼者
之難也
周南
關雎五章
關雎雎鳩在河之洲窈窕淑女君子好逑

Fig. 2.3.6.6 Shīzǒngwén, juan 1A, folio 4A

1) The rosy brown and turquoise components mean the preceding signs. There are two and only two fingering letters used for preceding sign. The rosy brown one is 从 that means "从" "'from' sign", and the turquoise one is 厶 that means "至" "'to' sign". These two often occur at the same time. We call this one as "preceding fingering letter" which is marked as **P**.

2) Based on the rationale, the black components could be used as any ideograph, but the range of ideographs actually used is very limited, and each pair of ideographs used with the "from" sign and "to" sign are used in some stable words or famous poems. Figs 2.3.6.2 through 2.3.6.5 meant the score named 《關雎》 which the purport comes from the first poem of the Chinese earliest collection of poems *Classic of Poetry* (《詩經》), please also see Fig. 2.3.6.6. The ideographs used in the first sentence are used as the marks in this case. In Fig. 2.3.6.4, the negative bicyclic 雎 with the rosy brown square and 鳩 with the turquoise square had defined the scope. In Fig. 2.3.6.5, Examples 6-3 and 6-4 meant to replay the scope from 雎 to 鳩 mentioned in Fig. 2.3.6.4. The situations of Examples 6-1 and 6-2 are similar. Note that the glyph for Example 6-1 doesn't match the evidence totally now, but we trust 關 and 関 could be unified as the ideographic components, even if there is no UCV to handle the relationship (if any reviewer hope there is a UCV rule for this pair, Eiso can present this at the IRG meeting to get a new proper UCV), and the corresponding negative bicyclic form with

the rosy brown square in Fig. 2.3.6.3 is 關 clearly. We call this one as "common Hanzi" which is marked as **H**. This kind of element can't be treated as the Jianzi fingering letter.

2.3.7. Phased summary on the types

Based on the above analysis and explanation, we can get the following table.

Table 2.3 Type of elements of the big-sized "character"

Mark	**Name**	**Applicable Type**	**Fingering Letter**
A	auxiliary fingering letter	1, 2, 3, 5	Yes
C	core fingering letter	1, 2, 3, 4, 5	Yes
H	common Hanzi	6	No
I	initial fingering letter	1, 2, 3, 5	Yes
L	left-hand fingering letter	1, 2, 3, 5	Yes
M	marker & sub-marker	1, 2, 3, 5	Yes
N	times/pure numeral	5	Yes
O	other fingering letter	4	Yes
P	preceding fingering letter	6	Yes
S	string	1, 2, 3	Yes
T	tail	1, 3, 5	Yes

2.3.8. Typo

We also collect a small number of typos from different books. We just mention them here, and there is no need to do more in the followings, because these examples are incorrect for the music theory of Guqin music.

2.3.8.1. Example 8-1

This example mixed one small-sized character (猱) and one big-sized character (勾六弦) as one big-sized form. 犭"猱" looks like the auxiliary fingering letter in the following blue one based on the shape, but 犭"猱" is only used for the small-sized "characters".

Table 2.3.8.1 Comparison on Example 8-1

	
wrong	right

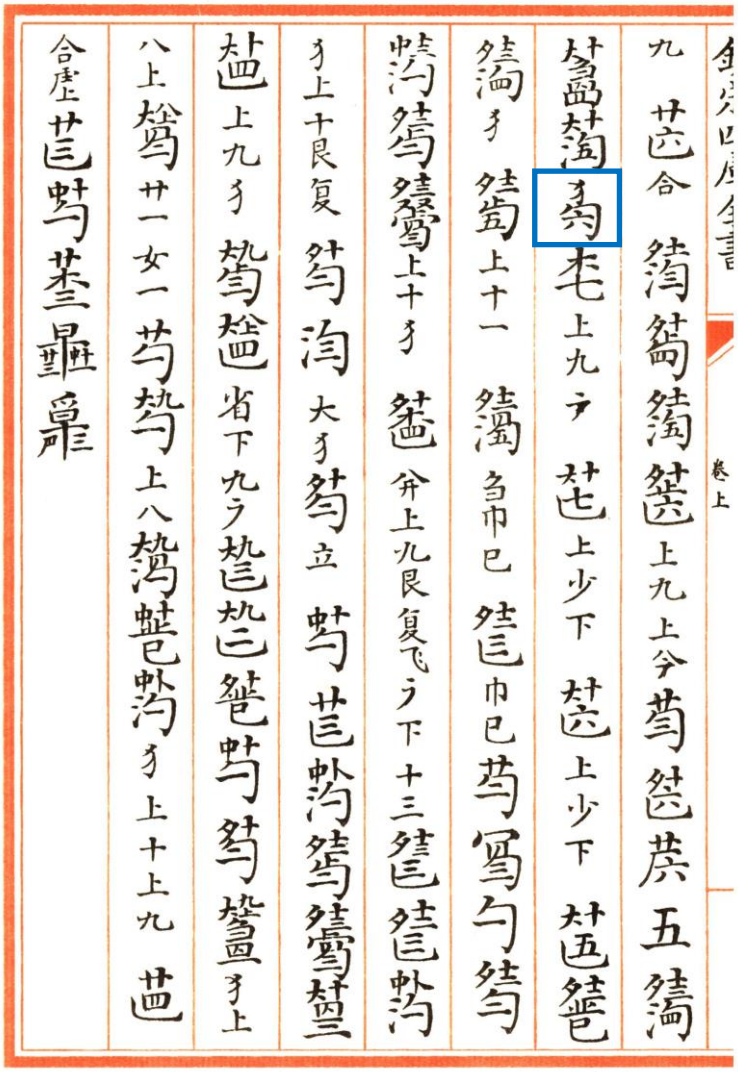


Fig. 2.3.8.1 Wényuāngé Sìkù Quánshū Běn: Sōngxiánguǎn Qínpǔ, juan A, folio 4B

2.3.8.2. Example 8-2

This example made one element wrong. 立 "撞" looks like string in the following blue one based on the shape. The element 立 "撞" can't be used after the core fingering letter, but it can be used before the core fingering letter..

Table 2.3.8.2 Comparison on Example 8-2

𡗶	𡗶
wrong	right

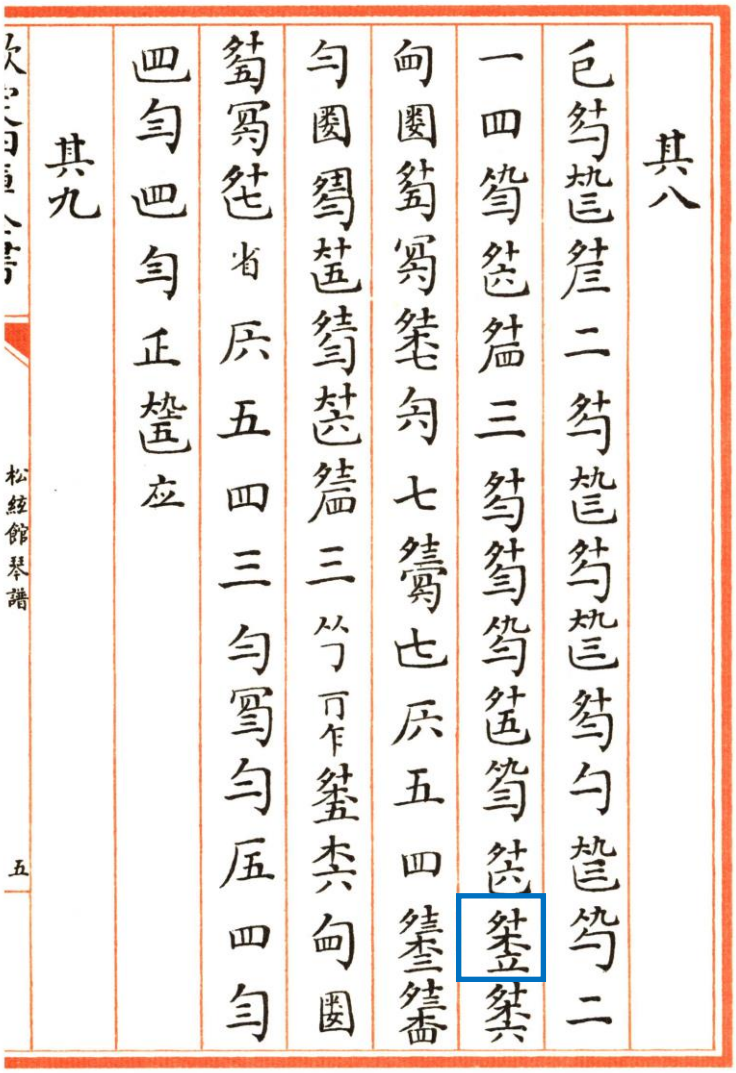


Fig. 2.3.8.2 Wényuāngé Sìkù Quánshū Běn: Sōngxiánguǎn Qínpǔ, juan A, folio 5A

2.3.8.3. Example 8-3

This example mixed one small-sized character (猱) as the part of one big-sized character (撮名指十徽五弦散二弦) at the lower left corner. 犭 "猱" looks like the string in the following blue one based on the shape, but 犭 "猱" is only used for the small-sized "characters".

Table 2.3.8.3 Comparison on Example 8-3

	
wrong	right

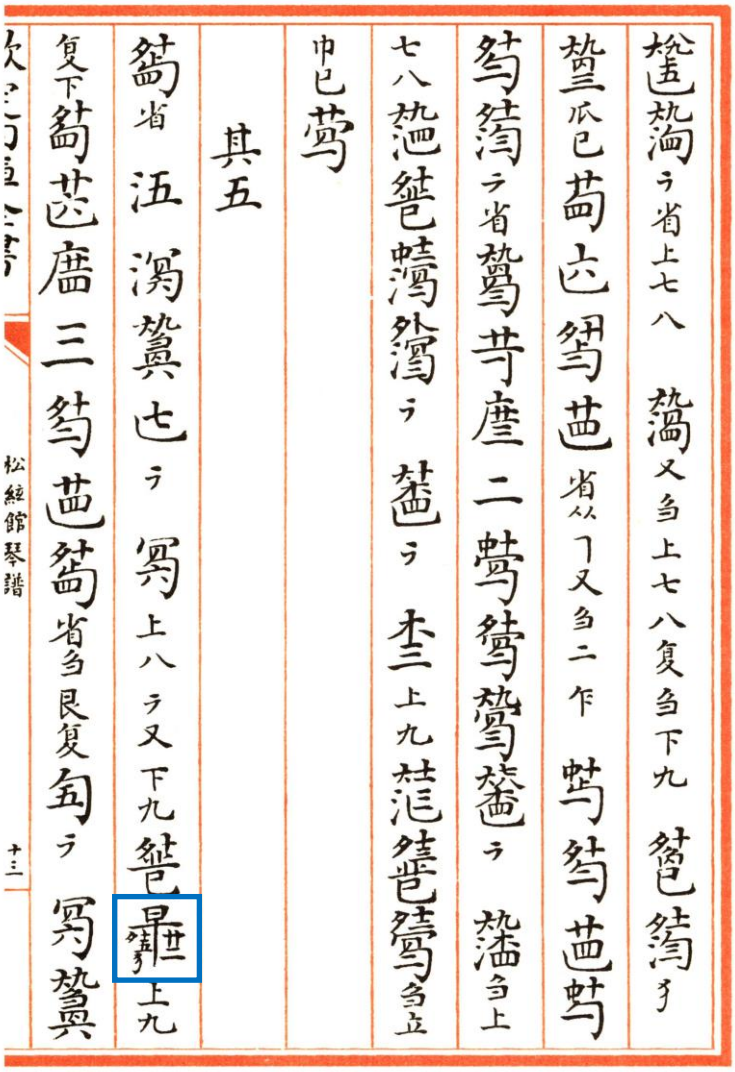


Fig. 2.3.8.3 Wényuāngé Sìkù Quánshū Běn: Sōngxiánguǎn Qínpǔ, juan A, folio 13A

2.3.8.4. Example 8-4

This example made one element wrong (至), and this wrong element and the previous element (六弦) look like the corresponding core fingering letter (滾) together.

Table 2.3.8.4 Comparison on Example 8-4

	
wrong	right

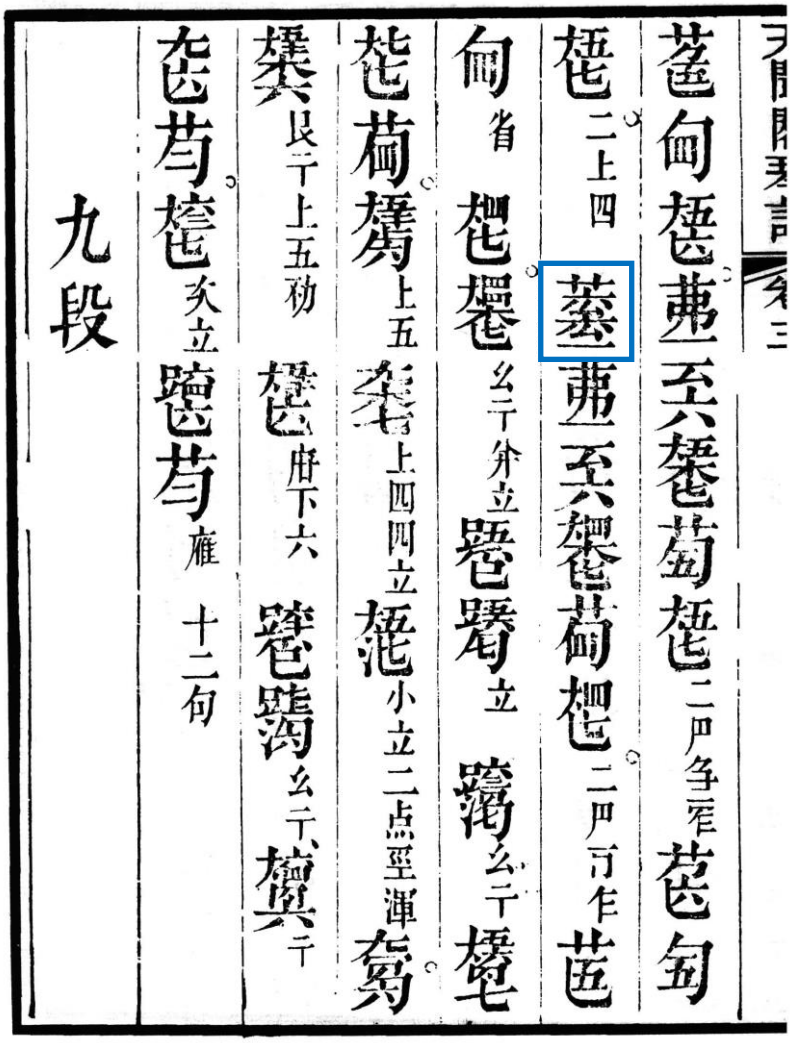


Fig. 2.3.8.4 Tiānwéngé Qínpǔ, juan 3, folio 5B

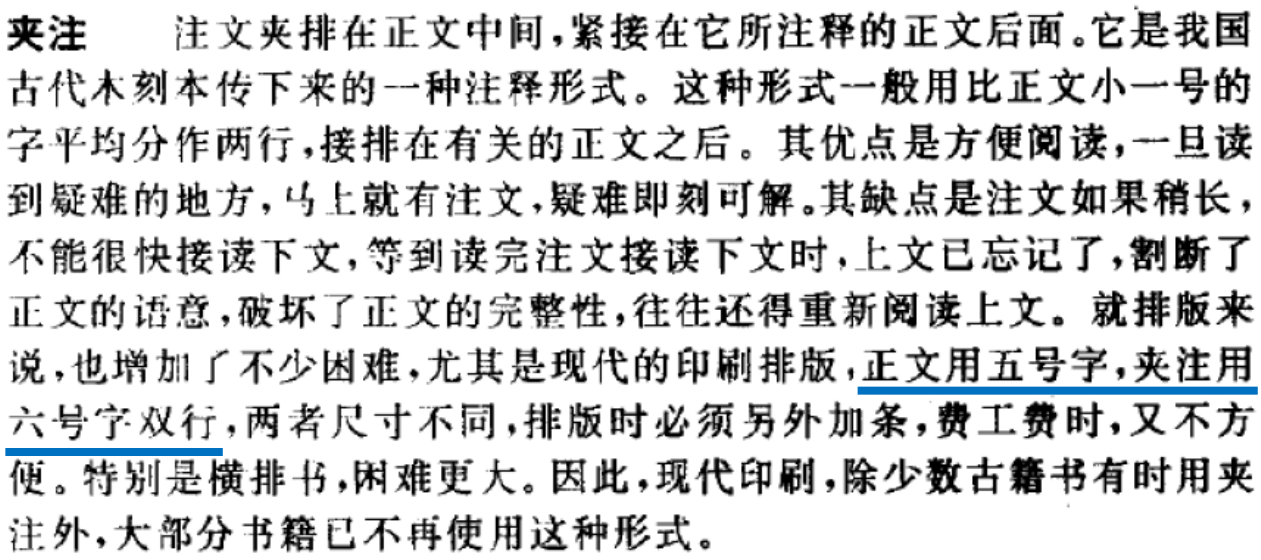
2.4. Small-sized "characters"

The small-sized "characters" here means 旁字 (pángzì) or 小字 (xiǎozì) in Chinese.

When the readers who are unfamiliar with the Jianzi Musical Notation read the ancient books included the Jianzi scores, they will feel that the small-sized "characters" like the common interlinear explanatory note (夹注) in other ancient books written with the Chinese writing system, especially for ancient literary Chinese (ISO 639-3 code is lzh). There is no denying that they are very similar, but the result we get is not reliable just by feeling. In order to understand this issue, we need to sort out what the meaning of the Chinese traditional interlinear explanatory note is first.

As Fig. 2.4.0.1 shows, the interlinear explanatory note is the explanatory notes inserted in the middle of the text, temporarily cutting off the original text semantics, which its advantage is that readers can get the understanding of difficult words in time. This typesetting form inherited from Chinese traditional wood-engraving printing technology for the vertical layout, and movable type printing technology continues to use this form for the vertical layout. However, the modern computer typesetting has abandoned this practice largely, which the most important reason is the support of the typesetting software and OFF/OpenType is very poor. In W3C TR JLREQ, the similar one is called as "inline cutting note" (*warichu*, 割注), and the practical habit is similar to the sentence with the blue underline as below, that means the font size of one original-sized text character is No. 5 (五号), and the one of one small-sized explanatory character is No. 6 (六

号).



夹注　注文夹排在正文中间，紧接在它所注释的正文后面。它是我国古代木刻本传下来的一种注释形式。这种形式一般用比正文小一号的字平均分作两行，接排在有关的正文之后。其优点是方便阅读，一旦读到疑难的地方，马上就有注文，疑难即刻可解。其缺点是注文如果稍长，不能很快接读下文，等到读完注文接读下文时，上文已忘记了，割断了正文的语意，破坏了正文的完整性，往往还得重新阅读上文。就排版来说，也增加了不少困难，尤其是现代的印刷排版，正文用五号字，夹注用六号字双行，两者尺寸不同，排版时必须另外加条，费工费时，又不方便。特别是横排书，困难更大。因此，现代印刷，除少数古籍书有时用夹注外，大部分书籍已不再使用这种形式。

Fig. 2.4.0.1 Túshū Bàozhǐ Qīkān Biān-Yìn-Fā Yèwù Cídiǎn, p. 220

Fig. 2.4.0.2 shows the stone stele of *The Classic of Filial Piety* (石台孝经碑) which is collected in Forest of Stone Steles Museum of Xi'an City, Shaanxi Province (陕西省西安碑林博物馆). *The Classic of Filial Piety* (《孝经》) was treated as one of the Confucian classics (儒家经典) in ancient China, which was written by Confucius (孔子) and his disciples. This stele was originally written by Lǐ Lóngjī (李隆基) who was the seventh emperor (玄宗) of Chinese Tang Dynasty (唐代), and its top in the seal style was written by his crown prince (太子) Lǐ Hēng (李亨) who would be the eighth emperor (肃宗), that could provide the hand-written form of the interlinear explanatory note at that time. The interlinear explanatory notes were also edited by Lǐ Lóngjī himself, that was the most popular version with the further explanatory notes edited by Xíng Bǐng (邢昺).

One of the modern publishing photo-offset copy was published by Cultural Development Press (文化发展出版社) in 2017. This modern publication cut the Lishu style (隶书) characters verbatim and re-typeset to match the form of eight original-sized text characters per page with two vertical lines. Fig. 2.4.0.3 shows the width and the height of the glyph for one small-sized explanatory character are both half of the ones for one original-sized text character. The reading ordering of the small-sized explanatory text is showed as the translucent arrows in Fig. 2.4.0.3, that means there will be the line-breaking behavior in line.



Fig. 2.4.0.2 Stone stele of the Classic of Filial Piety
(See http://book.kongfz.com/267066/1450768130/)

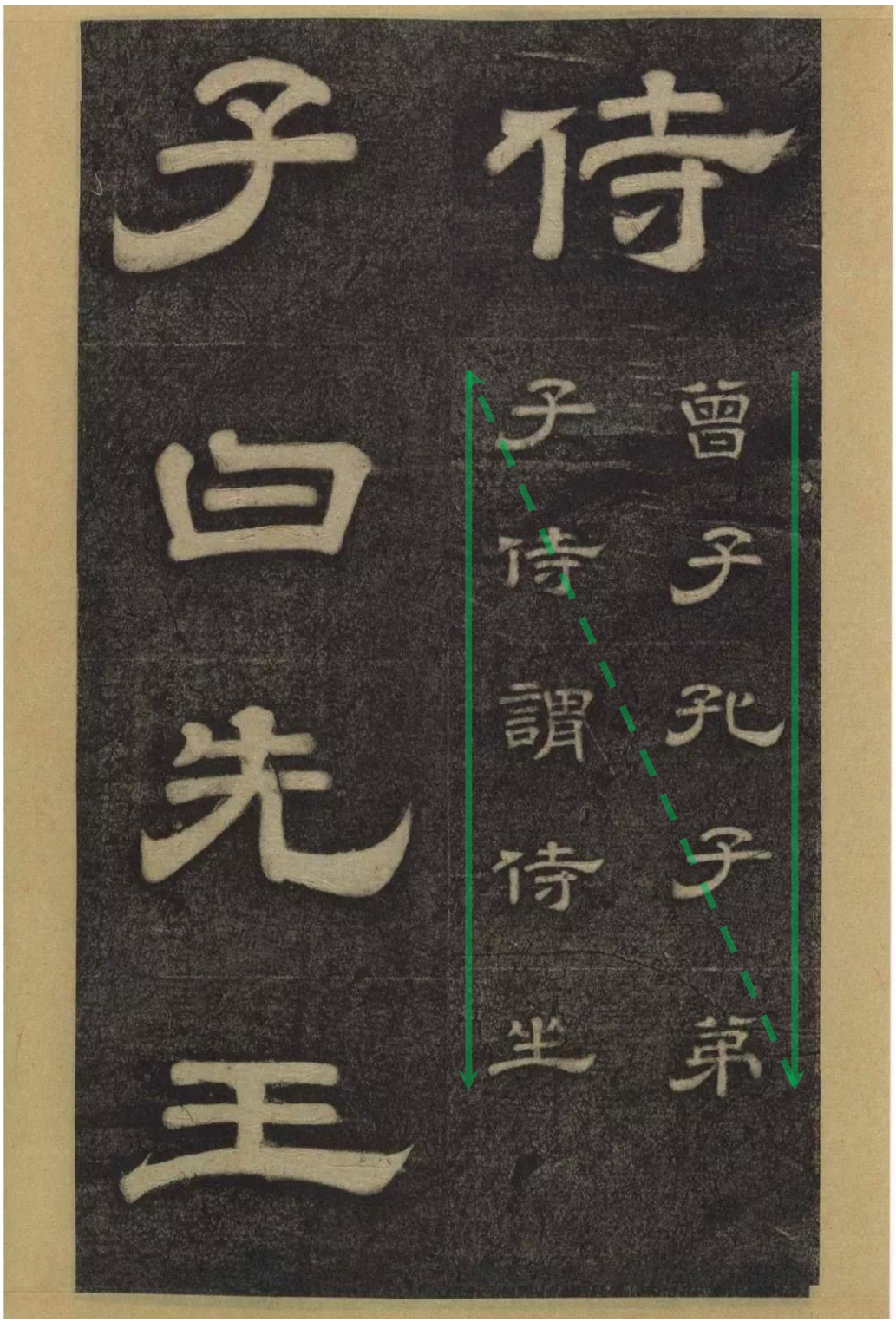


Fig. 2.4.0.3 Shítái Xiàojīng
(See http://book.kongfz.com/267066/1450768130/)

Fig. 2.4.0.4 shows one use case of the interlinear explanatory notes in one book published in early Chinese Ming Dynasty (明代). We can easily know that the width and height relations between two kinds of characters are untidy.



Fig. 2.4.0.4 *Zēngxiū Jiāzhù Miàoxuǎn Qúnyīng Cǎotáng Shīyú, Set A, juan A, folio 2A*

Figs. 2.4.0.5 through 2.4.0.7 show three editions (*or* versions) of *Shuōwén Jiězì* (《説文解字》). We mainly focus on the entry of 水 (*U+39EBE in WG2 N5209) all with the blue rectangle here. In Figs. 2.4.0.5 and 2.4.0.6, the interlinear explanatory notes are both only used for fanqie (反切, please see more details about fanqie on L2/23-002R), but the width and height relations between two kinds of characters in Fig. 2.4.0.5 are still untidy. Fig. 2.4.0.6 shows the width of the glyph for one original-sized text character is greater than the height, and the height of the glyph for one small-sized explanatory character is slightly greater than the width, which the face basically close to the shape of square. On the other hand, the heights of two kinds of characters are the same, and the width of the glyph for one small-sized explanatory character is close to the half of the one for one original-sized text character. In Fig. 2.4.0.7, the author added more explanatory notes which broke the original sentences. The face of the glyphs for two kinds of characters and the width and height relations

are similar to the ones in Fig. 2.4.0.6, but more gaps are left on the both sides of one original-sized text character, that made the face closer to the square.

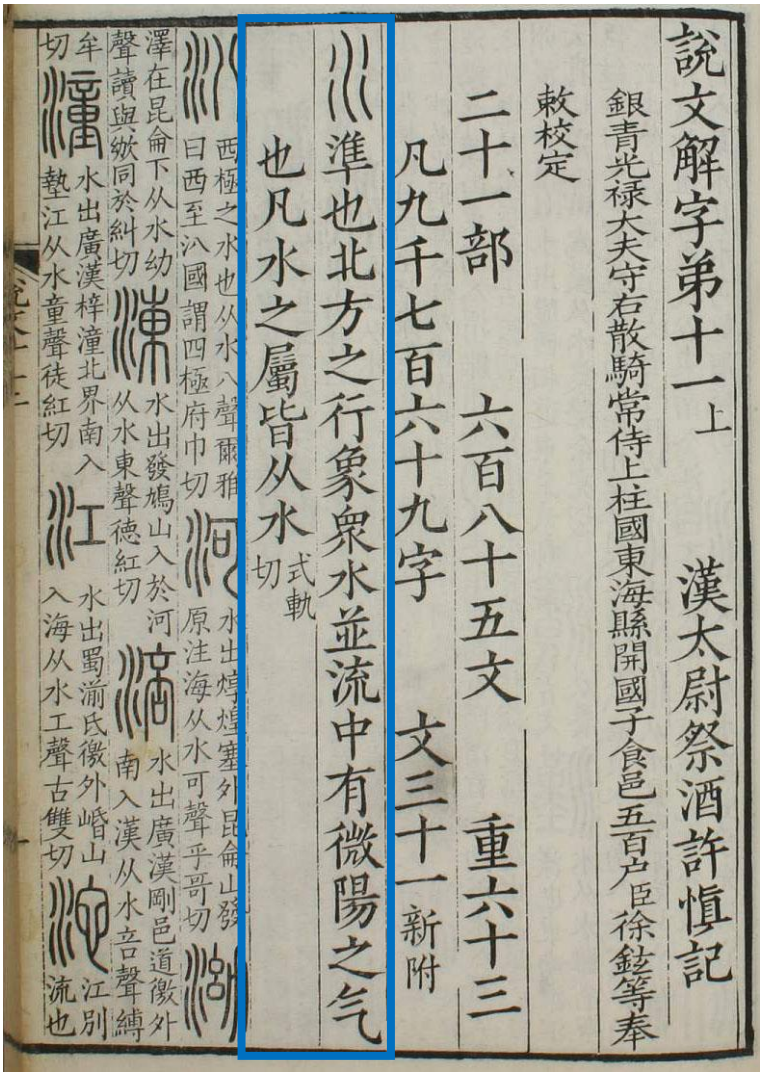
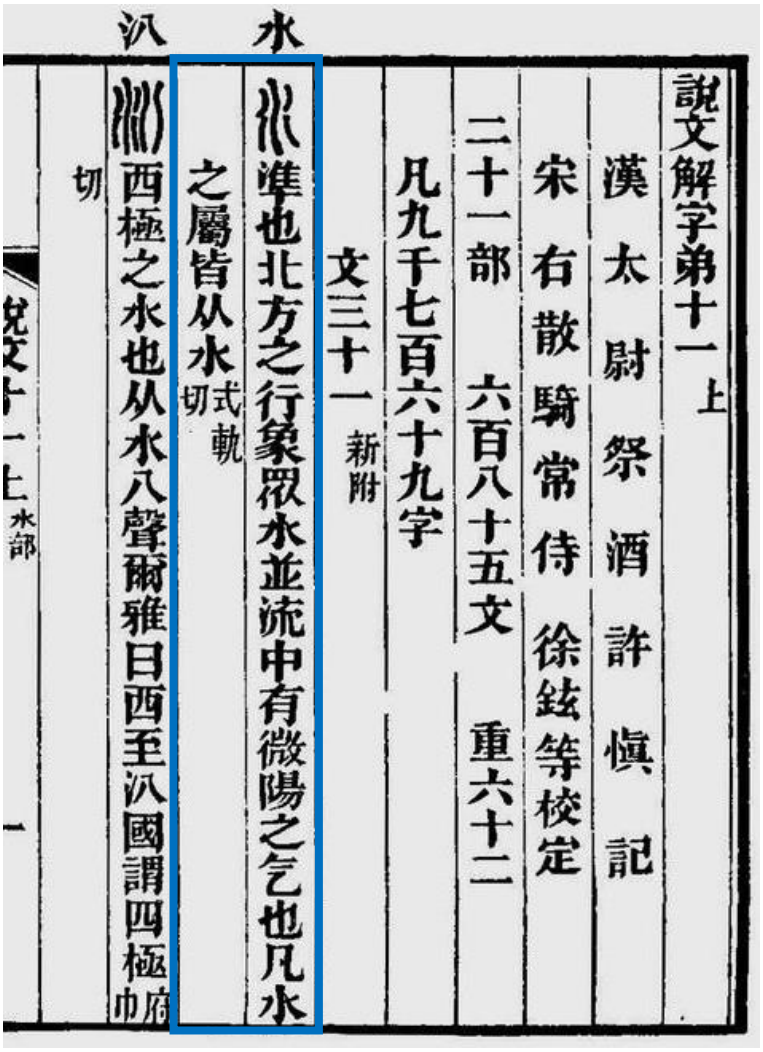

說文解字弟十一上　漢太尉祭酒許慎記
銀青光祿大夫守右散騎常侍上柱國東海縣開國子食邑五百户臣徐鉉等奉
敕校定
二十一部　六百八十五文　重六十三
凡九千七百六十九字　文三十一新附
水準也北方之行象衆水並流中有微陽之气
也凡水之屬皆从水式軌切
汃西極之水也从水八聲爾雅曰西至汃國謂四極府巾切
河水出焞煌塞外昆侖山發原注海从水可聲乎哥切
渤澤在昆侖下从水幼聲讀與欮同於糾切
涷水出發鳩山入於河从水東聲德紅切
滴水出廣漢剛邑道徼外南入漢从水啇聲縛牟切
潼水出廣漢梓潼北界南入墊江从水童聲徒紅切
江水出蜀湔氐徼外嶓山入海从水工聲古雙切
沱江別流也

Fig. 2.4.0.5 THX edition of Shuōwén Jiězì, juan 11, folio 1A



說文解字弟十一上

漢太尉祭酒許愼記

宋右散騎常侍徐鉉等校定

二十一部　六百八十五文　重六十二

凡九千七百六十九字

文三十一 新附

水

準也北方之行象眾水並流中有微陽之乞也凡水之屬皆从水 式軌切

汃

西極之水也从水八聲爾雅曰西至汃國謂四極 府巾切

說文十一上 水部 一

Fig. 2.4.0.6 CCZ edition of Shuōwén Jiězì, juan 11, folio 1A

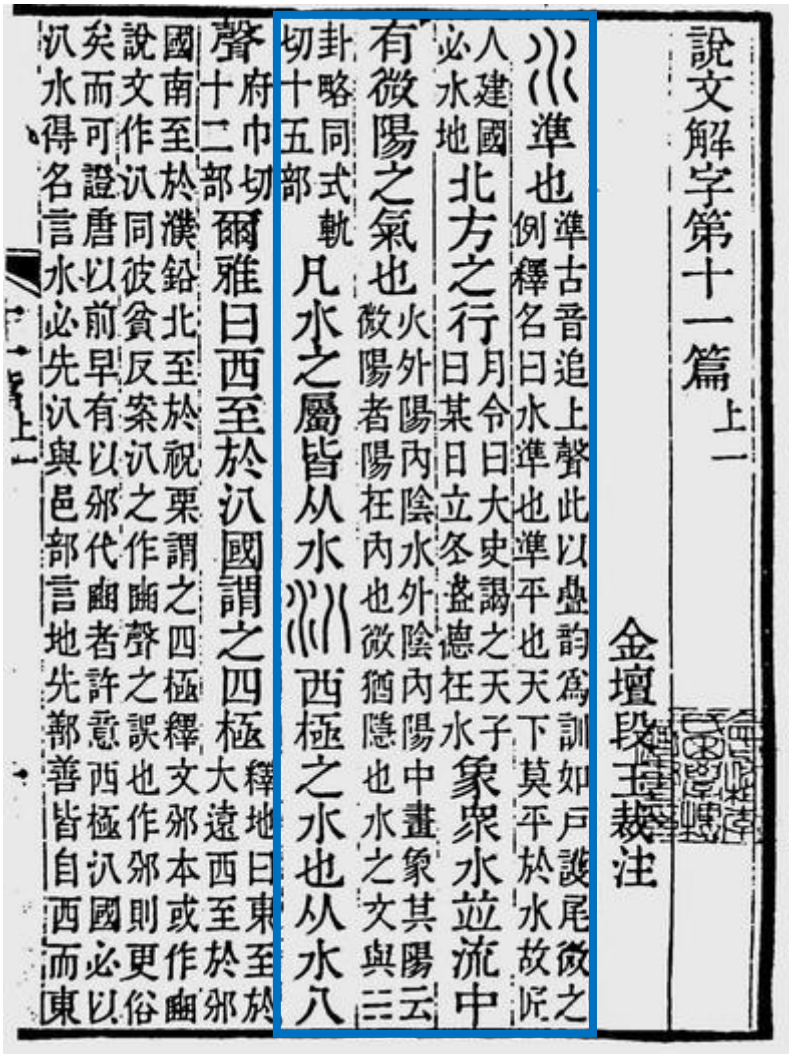
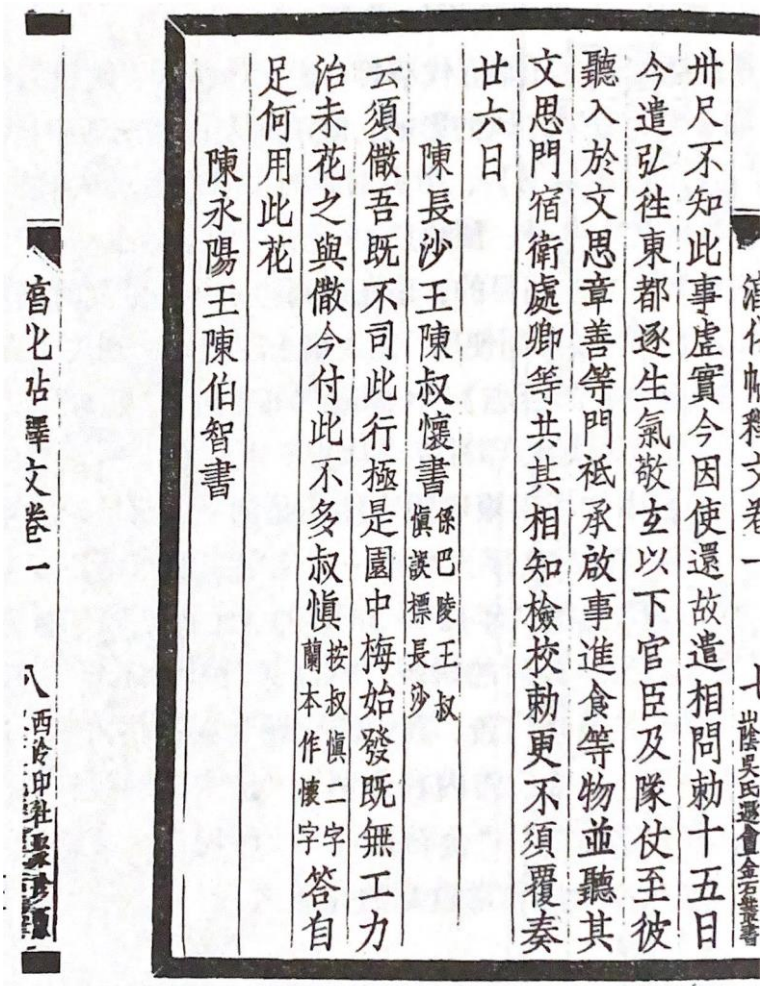

說文解字第十一篇上一
金壇段玉裁注
準也準古音追上聲此以疊韵爲訓如戶護尾微之例釋名曰水準也準平也天下莫平於水故匠人建國必水地北方之行月令曰大史謁之天子曰某日立冬盛德在水象衆水竝流中有微陽之氣也火外陽內陰水外陰內陽中畫象其陽云微陽者陽在內也微猶隱也水之文與☵卦略同式軌切十五部凡水之屬皆从水西極之水也从水八聲府巾切十二部爾雅曰西至於汃國謂之四極釋地曰東至於大遠西至於邠國南至於濮鉛北至於祝栗謂之四極釋文邠本或作豳說文作汃同彼貧反案汃之作豳聲之誤也作邠則更俗矣而可證唐以前早有以邠代豳者許意西極汃國必以汃水得名言水必先汃與邑部言地先鄯善皆自西而東

Fig. 2.4.0.7 Shuōwén Jiězì Zhù, juan 11, folio 1A

In the end of Chinese Qing Dynasty (清代), the conventions became something different. The face of the glyph for one original-sized text character is kept as a square, and the height of the glyph for one small-sized explanatory character is greater than the width, that means the face looks like a rectangle. On the other hand, the heights of two kinds of characters are the same, and the width of the glyph for one small-sized explanatory character is close to the half of the one for one original-sized text character. As Prof. Sun Mingyuan's (孙明远) comment, the typeface mentioned in Fig. 2.4.0.10 (aka 聚珍仿宋体) was inspired in part by the typeface mentioned in Fig. 2.4.0.8 (aka 仿宋聚珍版木活字), so the face of the glyphs for two kinds of characters and the width and height relations mentioned in Fig. 2.4.0.10 are the same as the ones mentioned in Fig. 2.4.0.8. Fig. 2.4.0.9 shows the information clearly.



卅尺不知此事虛實今因使還故遣相問勅十五日今遣弘往東都逐生氣敬玄以下官臣及隊仗至彼聽入於文思章善等門祗承啟事進食等物並聽其文思門宿衛處卿等共其相知檢校勅更不須覆奏廿六日

陳長沙王陳叔懷書係巴陵王叔慎誤標長沙

云須徹吾既不司此行極是園中梅始發既無工力治未花之與徹今付此不多叔慎按叔慎二字蘭本作懷字答自足何用此花

陳永陽王陳伯智書

图 4-20 《宋拓淳化阁帖》

(图片来源：西泠印社聚珍版，中国书店影印本，1988)

Fig. 2.4.0.8 Jùzhēn Fǎngsòngtǐ Yánjiū, p. 66

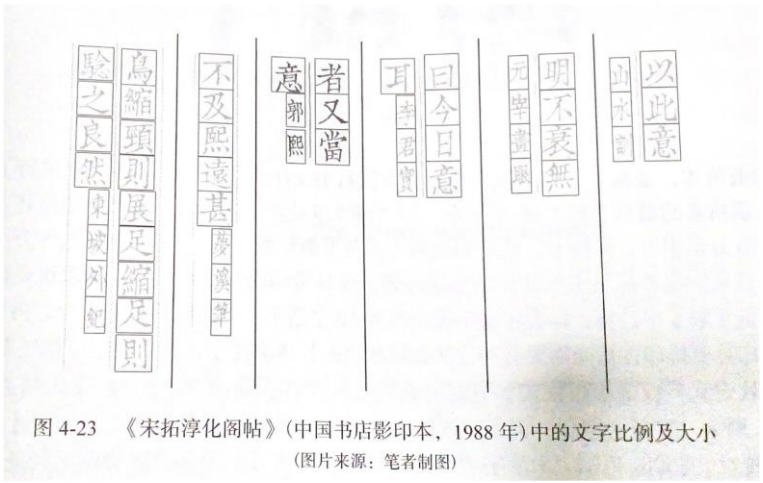


图 4-23 《宋拓淳化阁帖》(中国书店影印本，1988 年)中的文字比例及大小

(图片来源：笔者制图)

Fig. 2.4.0.9 Jùzhēn Fǎngsòngtǐ Yánjiū, p. 68

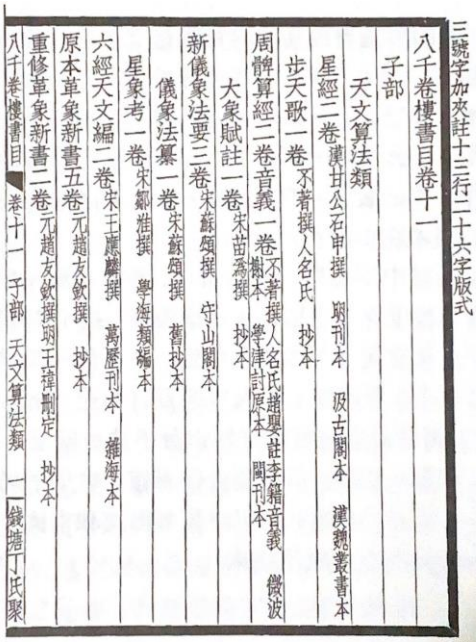
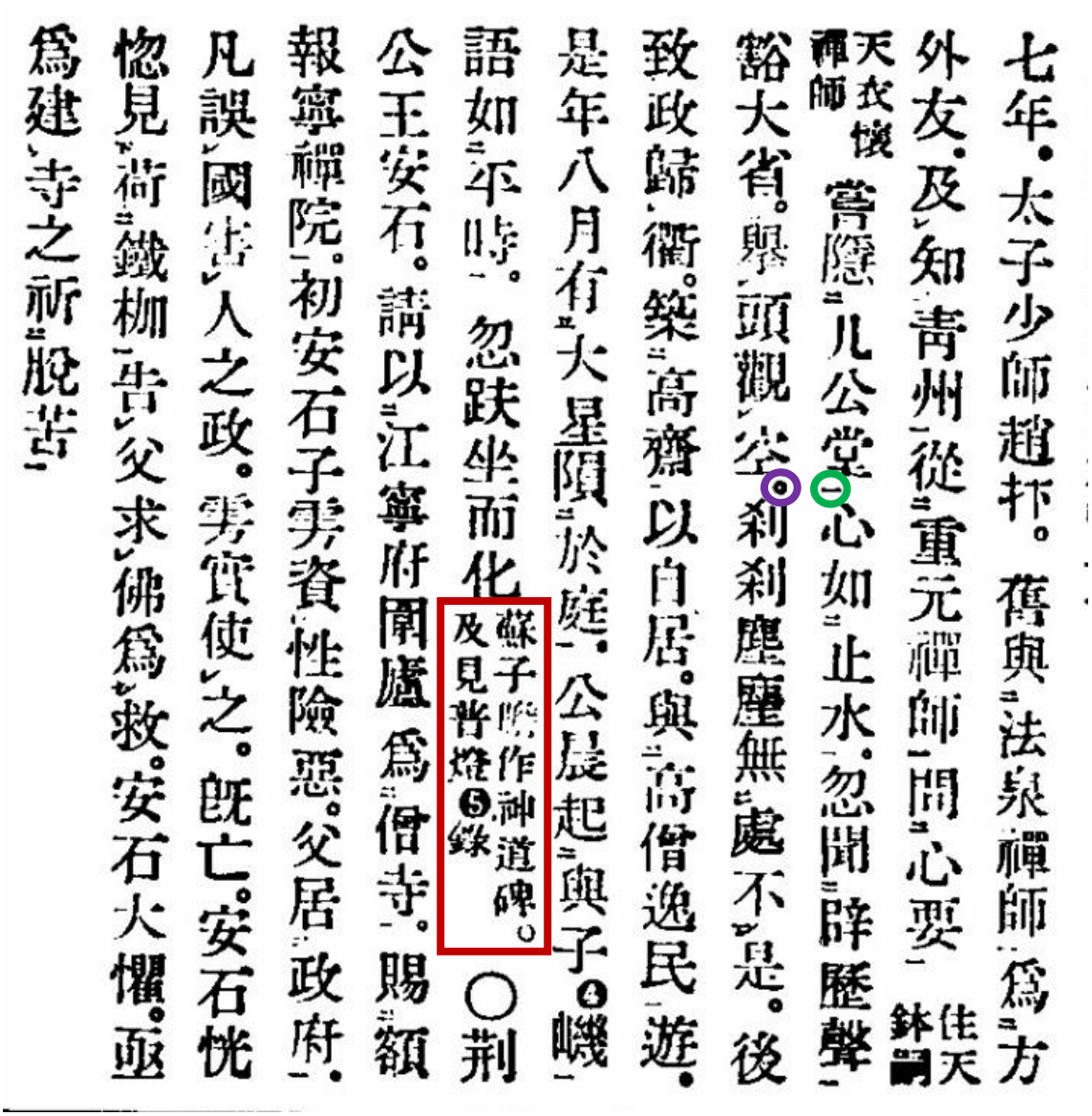


图 6-12 《八千卷楼书目·卷十一》

（图片来源：《聚珍仿宋版式各种样张》，上海聚珍仿宋印书局，1923。邢立藏）

Fig. 2.4.0.10 Jùzhēn Fǎngsòngtǐ Yánjiū, p. 103

Fig. 2.4.0.11 shows part of one page cited from *Saṃgaṇikīkṛtaṃ Taiśotripiṭakaṃ* which is the main publishing source of the SAT-Submitted characters in IRG WSes. The width and the height of the glyph for one original-sized text character are basically equal, which the face is basically close to the shape of square, but the width of the glyph for one small-sized explanatory character is slightly greater than the length, that the face is also close to the shape of square, but it looks like a rectangle in visual. (See the dark red rectangle as below.) The width of the glyph for one original-sized text character is slightly greater than the one for one small-sized explanatory character, but not twice as much, so more gaps are left on the both sides of one original-sized text character. The height of the glyph for one small-sized explanatory character is close to 7/10 of the one of one original-sized text character. There is also one kind of small-sized character which is kaeriten/kanbun mark (返り点) in the lower left corner outside of the face of one original-sized text character (see the green circle as below and L2/20-232, L2/21-082), and the punctuation should be the lower right corner at the same horizontal line with kanbun mark (see the purple circle as below). Note that the kanbun mark is totally different from the small-sized explanatory characters.



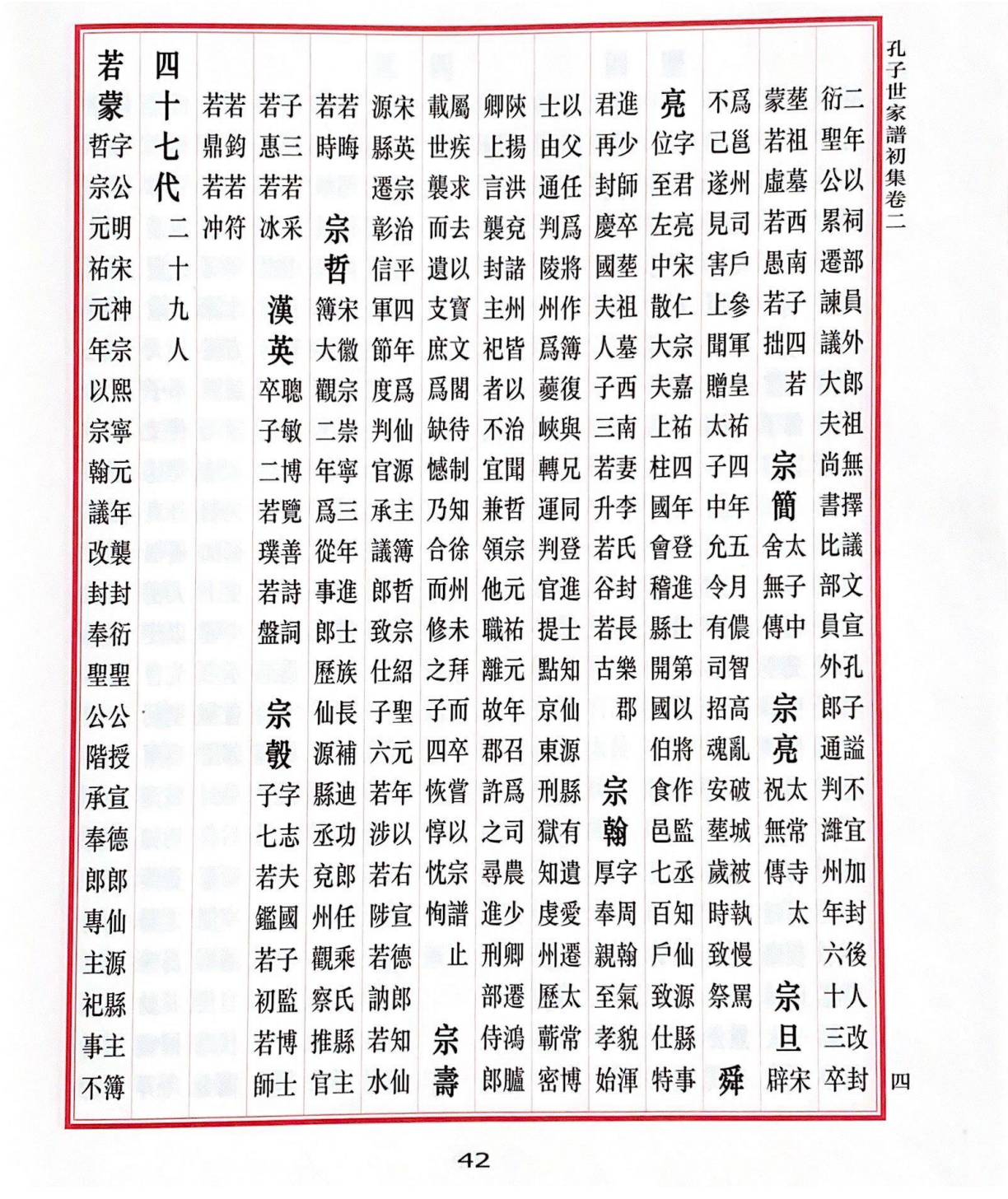
七年。太子少師趙抃。舊與法泉禪師爲方
外友。及知青州從重元禪師問心要 住天鉢嗣
天衣懷禪師 嘗隱几公堂心如止水。忽聞辟歷聲
豁大省。舉頭觀空。刹刹塵塵無處不是。後
致政歸衢。築高齋以自居。與高僧逸民遊。
是年八月有大星隕於庭。公晨起與子❹巘
語如平時。忽趺坐而化 蘇子瞻作神道碑。及見普燈❺錄 ○荊
公王安石。請以江寧府圍廬爲僧寺。賜額
報寧禪院。初安石子雱資性險惡。父居政府。
凡誤國害人之政。雱實使之。既亡。安石恍
惚見荷鐵枷告父求佛爲救。安石大懼。亟
爲建寺之祈脫苦

Fig. 2.4.0.11 Fózǔ Tǒngjì, p. 416

In some modern publications, more gaps are added to make the typographic rendering effects like the conventions in Chinese Qing Dynasty, which the relationship of the sizes between original-sized text characters and small-sized explanatory character follows the rule mentioned in Fig. 2.4.0.1, so the relationship still follows Fig. 2.4.0.11, but the whole page looks more like Figs. 2.4.0.8 through 2.4.0.10. Please see Fig. 2.4.0.12.

If the fonts and the typesetting software can't support the replaced glyphs and typesetting mode to make the final typographic rendering effect on the modern digitized software, the better effect should be like Fig. 2.4.0.12.

In the paper *The Development, Dissemination, Influence and Redesign of the Chinese Regular Script — The 90th Anniversary of the Chinese Regular Script*, Prof. Sun and Mr. Wang mentioned there are three kinds of the font Hànwén Zhèngkǎi (汉文正楷), which the long style (长体) is the special one used for the common interlinear explanatory notes. (p. 77) However, the new digital redesigns mentioned in the same paper has not cover the long style yet.



42

Fig. 2.4.0.12 Kǒngzǐ Shìjiāpǔ, juan 1, p. 42

There is also one kind of special use we found in *Qínshū Cúnmù*. The sub-interlinear explanatory note was temporarily cutting off the running text of the interlinear explanatory note. (See the dark red rectangle as below.) The height of the glyph for one smaller-sized explanatory character used for the sub-interlinear explanatory note is the same as the one for one small-sized explanatory character used for the interlinear explanatory note and the original-sized text character, and the width of the glyph for one smaller-sized explanatory character used for the sub-interlinear explanatory note is close to the half of the one for one small-sized explanatory character used for the interlinear explanatory note. This is the very rare use case, but

we can treat it as the extended mode of the conventions in Chinese Qing Dynasty. The submitted evidence of WS2021-02453:UK-20336 and the new evidence (#9679) of WS2021-02367:VN-F0348 show the other similar use cases, but it just shows the pronunciation for the submitted character as fanqie and the additional notes.

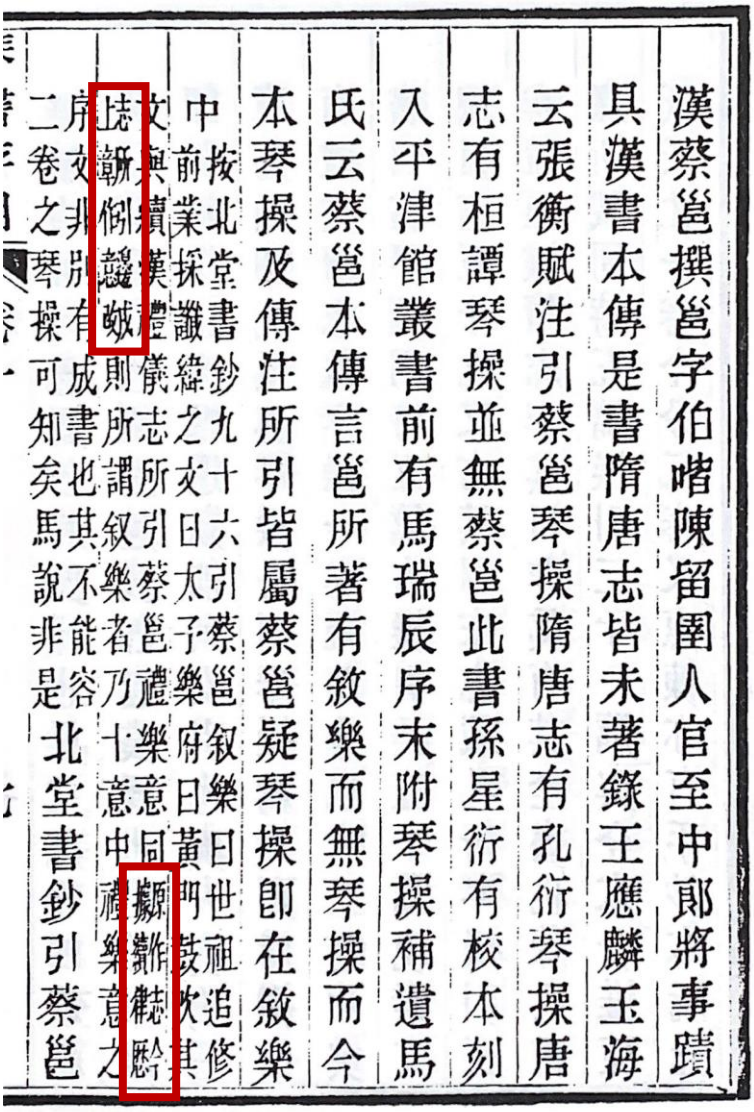


Fig. 2.4.0.13 Qínshū Cúnmù, juan 1, folio 7A

The interlinear explanatory note is quite rare in the modern publications. The red square in Fig. 2.4.0.14 shows an example to show the interlinear explanatory note, and the editorial reference base is also shown in Fig. 2.4.0.15. This is different from the modern editorial note made by Lu Xun (鲁迅) which is shown on the blue square in Fig. 2.4.0.14, and the note is not included in the editorial reference base in Fig. 2.4.0.16. Note that the green line in Fig. 2.4.0.14 shows as the common text, but this is the interlinear explanatory note in the editorial reference base as Fig. 2.4.0.15 shows. We have checked other ancient editions of this book, this sentence was also shown as the interlinear explanatory note, so maybe this is an editorial error in the modern publication, that means the interlinear explanatory note is not easy to make in the modern horizontal layouts. As Fig. 2.4.0.14 shows, the writing direction of the interlinear explanatory note in the modern horizontal layouts is to rotate the entire typographic box (the red square in Fig. 2.4.0.15) 90 degrees to the left from the

traditional vertical layouts to get the typographic feature as left-to-right and then up-to-down (the red square in Fig. 2.4.0.14) but keep the ideographic direction still upright, which is totally different from the layout of the Jianzi small-sized “characters”.

If a kind of typesetting software needs to support the interlinear explanatory note in the horizontal layouts or both in horizontal and vertical layouts, the typographic feature of horizontal part should be like Fig. 2.4.0.13 shows, such as [this one LaTeX project]. It also means the typographic feature of the Jianzi small-sized “characters” should not be rendered spontaneously in the typesetting software without any new encoding model.

蠵龟者，俗谓之兹夷，乃山龟之巨者。人立其背上，可负而行。产潮、循山中，乡人采之，取壳以货。要全其壳，须以木楔出其肉。龟被楚毒，鸣吼如牛，声动山谷。广州有巧匠，取其甲通明黄色无日脚者，（甲上有散黑晕，为日脚矣。）煮而拍之，陷黑玳瑁花，以为梳篦杯器之属，状甚明媚。今所谓龟筒者是也。

蜈蚣：《南越志》云，大者其皮可以鞔鼓。取其肉暴为脯，美于牛肉。又云（鲁迅按：“又云”以下，《北户录》（一）作“沈莹《异物志》云”）长数丈，能啖牛。里人或遇之，则鸣鼓，然火炬，以驱逐之。

庞降，生于山野，多在橄榄树上。形如蜩蝉，腹青而薄，其声业，其鸣自呼为庞降。但闻其声，采得者鲜矣。人以善价求之，以为媚药。

宣歙人脱蜂子法（鲁迅按：“脱”，《本草》作“取”，此当误）：恂曾游宣歙间，见彼中人好食蜂儿，状如蚕蛹而莹白。大蜂结房于山林间，其大如巨钟，其中数百层。土人采时，须以草覆蔽体，以捍毒螫。复以烟火熏散蜂母，乃敢攀援崖木，断其蒂。一房中蜂子或五六斗至一石，择其未翅足

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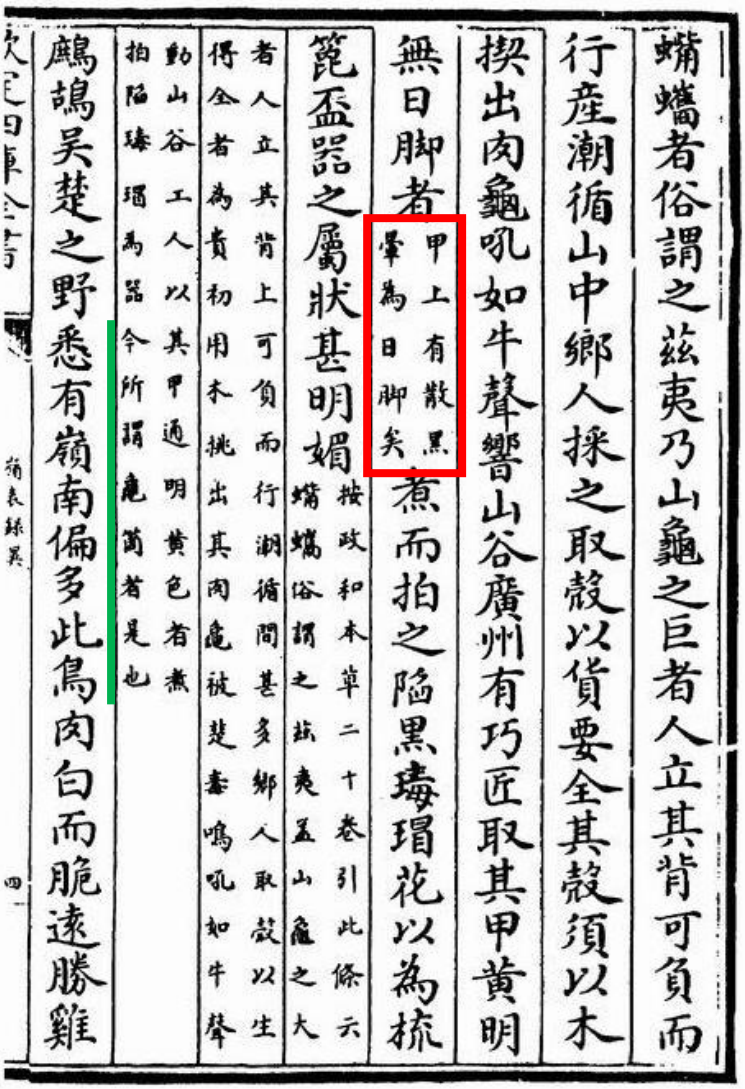
Fig. 2.4.0.14 Lǐngbiǎo Lù Yì (1983), p. 84


蠵蠵者俗謂之茲夷乃山龜之巨者人立其背可負而
行產潮循山中鄉人採之取殼以貨要全其殼須以木
揳出肉龜吼如牛聲響山谷廣州有巧匠取其甲黃明
無日脚者甲上有散黑
掌為日脚矣煮而拍之陷黑瑇瑁花以為梳
篦盃器之屬狀甚明媚按政和本草二十卷引此條云
蠵蠵俗謂之茲夷益山龜之大
者人立其背上可負而行潮循間甚多鄉人取殼以生
得全者為貴初用木挑出其肉龜被楚毒鳴吼如牛聲
動山谷工人以其甲通明黃色者煮
拍陷瑇瑁為器今所謂龜筒者是也
鷓鴣吳楚之野悉有嶺南偏多此鳥肉白而脆遠勝雞

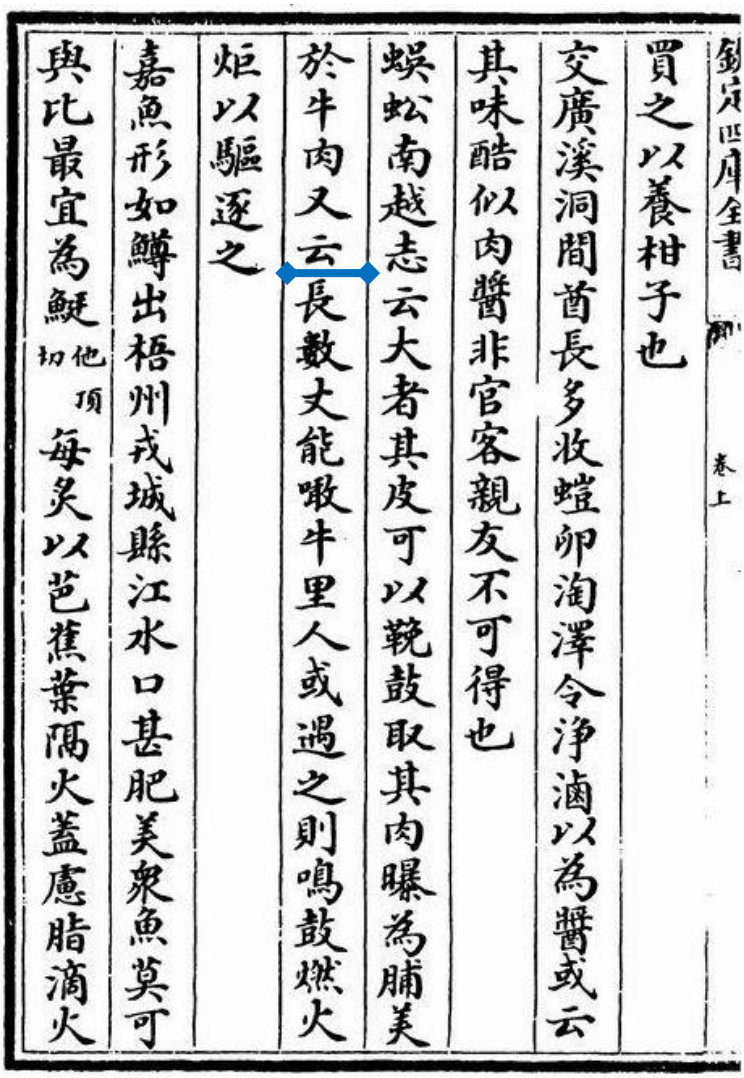


Fig. 2.4.0.16 Lǐngbiǎo Lù Yì (Siku Version), juan A, folio 4B

We also find other usages and typographic styles with subtle differences in the literary scripts of Chinese Xiqu Opera and Quyi Show, but they are not the common daily forms without the clear research now. We don't list them at this stage.

To sum up, the interlinear explanatory note is only used to explain one or more character(s) before them in general, but all of them could be skipped that the significance of the text would not be changed if the readers only need to read the original texts. Therefore, the interlinear explanatory note is not the necessary ingredient of the text, and it is not the encoding duty of UCS and Unicode. Maybe we will help ISO/IEC JTC1/SC29/WG3/AHG on Font Format, CLREQ and CSS WG under W3C on the related issues in future based on our research.

ARIB STD-B24 *Data Coding and Transmission Specification for Digital Broadcasting* includes the Kanji with 70% size shapes for the characters "氏", "副", "元", "故", "前" and "新" in Row 92 only used in Japanese modern digital broadcasting (Table 7-10 of that standard), that is totally different from what we mention above.

And then, let's see the details of the small-sized "characters" used in Jianzi scores.

2.4.1 Vertical layout

We checked 39 representative ancient books included the Jianzi scores, and we list two aspects (horizontal and vertical proportions) to compare the differences of the vertical layout among different books.

2.4.1.1. Horizontal proportion

As Table 2.4.1.1 shows, the double-lines form is used the most frequently (46.15%), and the rightward single-line form is also acceptable (33.33%). In the current typesetting environment, the double-lines form for Jianzi Musical Notation is as difficult to implement as the interlinear explanatory note for common Chinese Han writing system, so we think the best effect for the end-users should be the double-lines form, which is also not the duty of UCS and Unicode like the interlinear explanatory note. Now, the most convenient and concise implementation method should be the rightward single-line form without destroying the conventions and missing the semantics, and the typesetting software could implement the double-lines form based on the rightward single-line form with the help of OFF / OpenType.

Almost all the publishing times in Table 2.4.1.1 are based on the book *Lìdài Qínpǔ Guòyǎn Lù*, and some of them are different from Section 6. The publishing times of the Siku versions of the books are all recorded as 1792 that was the completion time of the whole series. Please also see the details of Siku series in IRGN2267R.

Table 2.4.1.1 Information on horizontal proportion

Width	**Amount**	**Books**
Rightward single-line (See Fig. 2.4.1.1)	13 (33.33%)	澄鑒堂琴譜 [1686], 德音堂琴譜 [1691], 蓼懷堂琴譜 [1702], 誠一堂琴譜 [1705], 臥雲樓琴譜 [1722], 立雪齋琴譜 [1730], 琴學練要 [1739], 研露樓琴譜 [1766], 松風閣琴譜 (Siku version) [1792], 百瓶齋琴譜 [1856], 天聞閣琴譜 [1876], 琴學叢書 [1911], 風宣玄品 [unknown]
Centered single-line (See Fig. 2.4.1.2)	4 (10.26%)	松弦館琴譜 (Siku version) [1792], 二香琴譜 [1833], 律話 [1833], 琴學入門 [1864]
Double-lines (See Fig. 2.4.1.3)	18 (46.15%)	太音大全集 [1413], 神奇秘譜 [1425], 杏莊太音補遺續編 [1557], 琴譜正傳 [1561], 琴譜合璧 [1573], 重修真傳琴譜 [1585], 琴書大全 [1590], 琴學彙粹 [1637], 徽言秘旨訂 [1692], 五知齋琴譜 [1722], 東皋琴譜 [1771], 自遠堂琴譜 [1802], 重刻律音彙考 [1835], 一經廬琴譜 [1845], 蕉庵琴譜 [1868], 枯木禪琴譜 [1893], 十一弦館琴譜 [1907], 沙堰琴編 [1946],
Rightward single-line or double-lines	1 (2.56%)	西麓堂琴譜 [1549]
Centered single-line or double-lines	2 (5.13%)	梧岡琴譜 [1546], 藏春塢琴譜 [1602]
Double-lines or more-lines	1 (2.56%)	琴譜合璧 (Siku version) [1792]

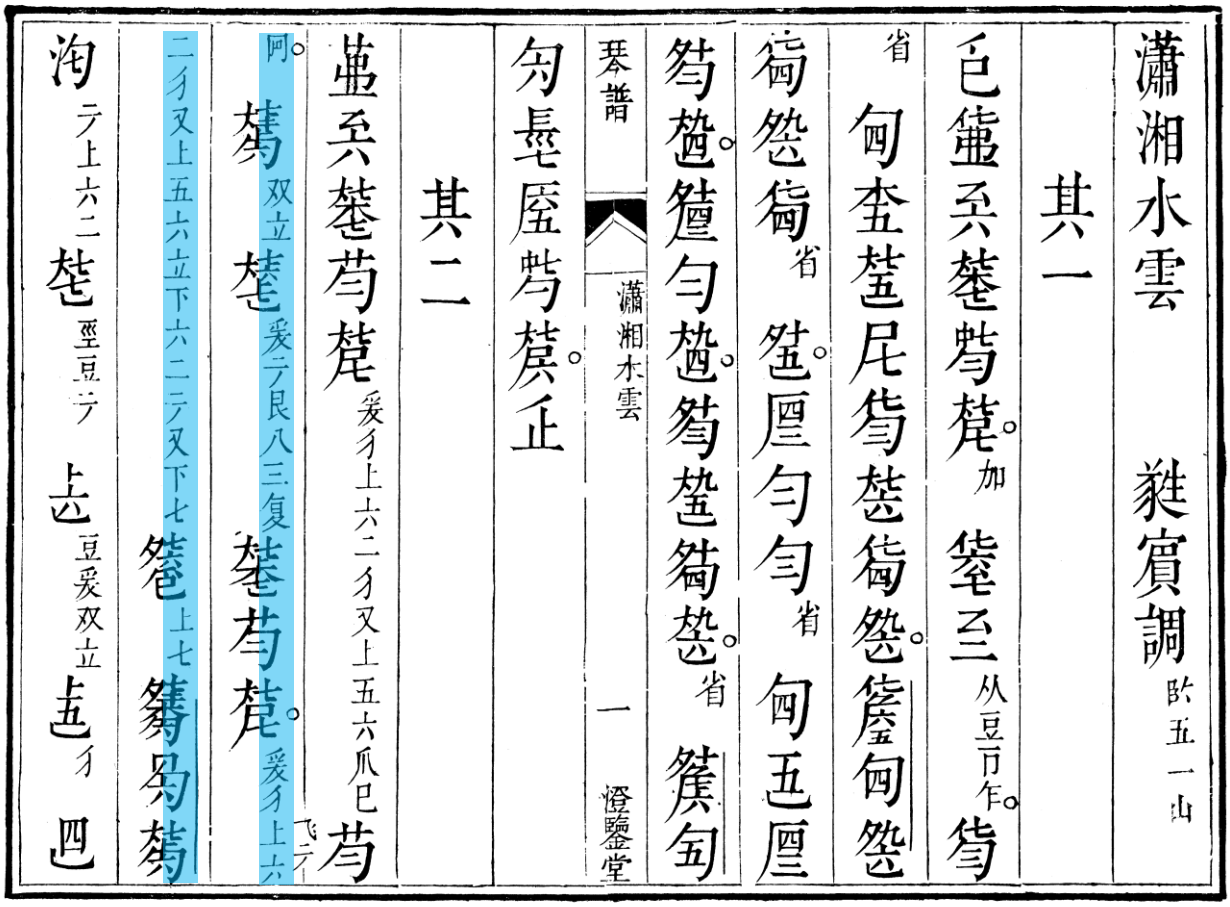


Fig. 2.4.1.1 Chéngjiàntáng Qínpǔ, Book 5, folio 1

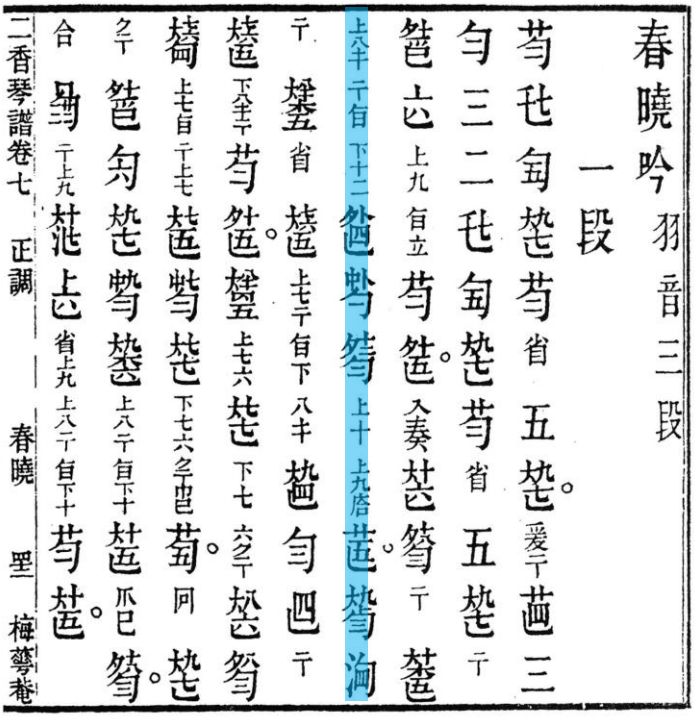


Fig. 2.4.1.2 Èrxiāng Qínpǔ, juan 7, folio 41A



Fig. 2.4.1.3 Wǔzhīzhāi Qínpǔ, Book 6, juan 8, folio 1

In 2016, China Bookstore (中国书店) published a series of books with the handwritten Jianzi scores and Gongche scores, which the book name is *Liú Shàochūn Qínpǔ Mòjì Xuǎn* written by 劉紹 (少椿 is his courtesy name) and there are five books. Books 1 and 2 used the double-lines form, Books 3 and 4 used the single-line form, Book 5 was a book only on Gongche scores. We can see two forms could both accepted and used by the same scholar or musician.

2.4.1.2. Vertical proportion

In the first column of Table 2.4.1.2, the value means the relations between the heights of the glyphs for the one small-sized "character" and one big-sized "character". For example, "Same" means their heights are the same; "1/2" means the height of the glyph for one small-sized "character" is a half of the one for one big-sized "character"; "Relatively free" means there is not so clear rules that the relations look not stable. As this table shows, "1/2" is the most frequently, "Same" and "1/3" is very rare which is not encouraged to support. On the other hand, "Relatively free" looks relatively frequently, but the digital typography needs some clear rules to make the layout tidier; "In a narrow space" is a special rule, but it is not a good point to include more long small-sized "character" sentence.

Table 2.4.1.2 Information on vertical proportion

Height	**Amount**	**Books**
Same (See Fig. 2.4.1.4)	1 (2.56%)	立雪齋琴譜 [1730]
1/2 (See Fig. 2.4.1.3)	16 (41.03%)	神奇秘譜 [1425], 澄鑒堂琴譜 [1686], 徽言秘旨訂 [1692], 誠一堂琴譜 [1705], 五知齋琴譜 [1722], 松弦館琴譜 (Siku version) [1792], 自遠堂琴譜 [1802], 律話 [1833], 一經廬琴譜 [1845], 琴學入門 [1864], 蕉庵琴譜 [1868], 天聞閣琴譜 [1876], 枯木禪琴譜 [1893], 十一弦館琴譜 [1907], 琴學叢書 [1911], 沙堰琴編 [1946]

Height	Amount	Books
1/3	1 (2.56%)	蓼懷堂琴譜 [1702]
Relatively free (See Fig. 2.4.1.5)	15 (38.46%)	太音大全集 [1413], 梧岡琴譜 [1546], 西麓堂琴譜 [1549], 杏莊太音補遺續編 [1557], 琴譜正傳 [1561], 琴書大全 [1590], 藏春塢琴譜 [1602], 琴學彙粹 [1637], 東皋琴譜 [1771], 卧雲樓琴譜 [1722], 研露樓琴譜 [1766], 松風閣琴譜 (Siku version) [1792], 琴譜合璧 (Siku version) [1792], 百瓶齋琴譜 [1856], 風宣玄品 [unknown]
In a narrow space (See Fig. 2.4.1.6)	2 (5.13%)	琴譜合璧 [1573], 重修真傳琴譜 [1585]
Same or 1/2	1 (2.56%)	重刻律音彙考 [1835]
1/2 or 1/3	3 (7.69%)	德音堂琴譜 [1691], 琴學練要 [1739], 二香琴譜 [1833]

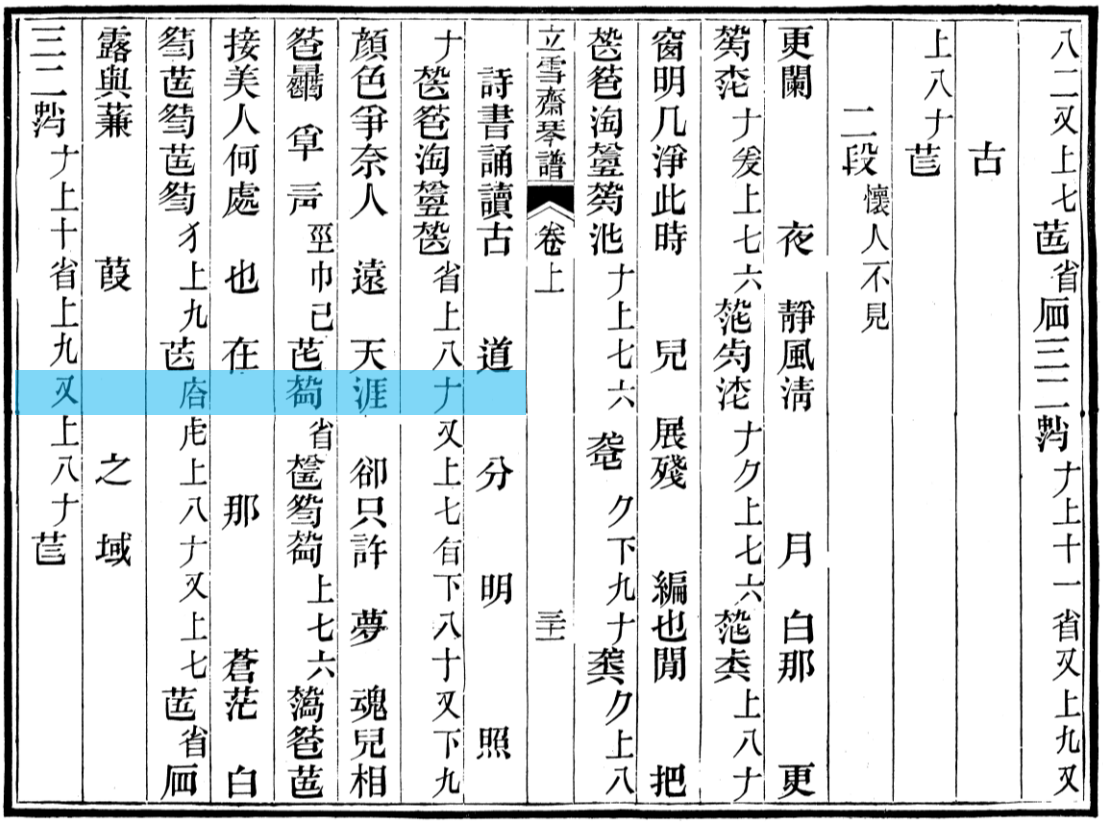


Fig. 2.4.1.4 Lìxuězhāi Qínpǔ, juan A, folio 31

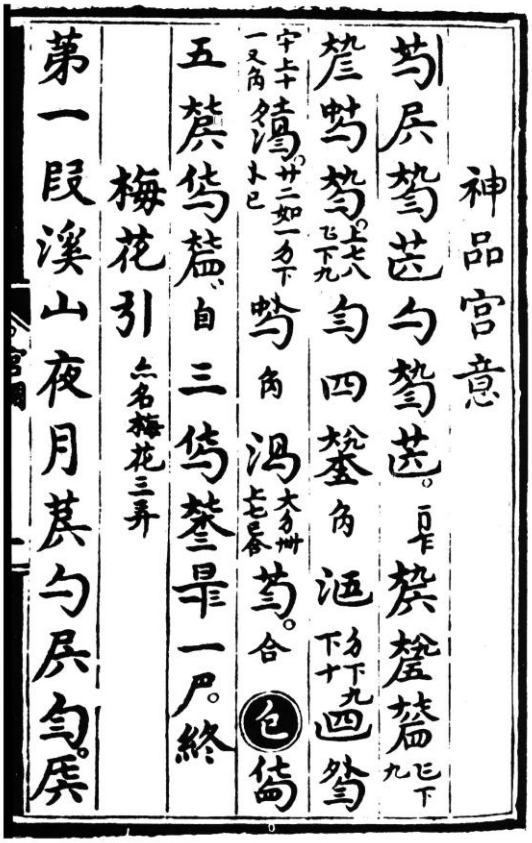


Fig. 2.4.1.5 Wúgāng Qínpǔ, Book 1, folio 1A

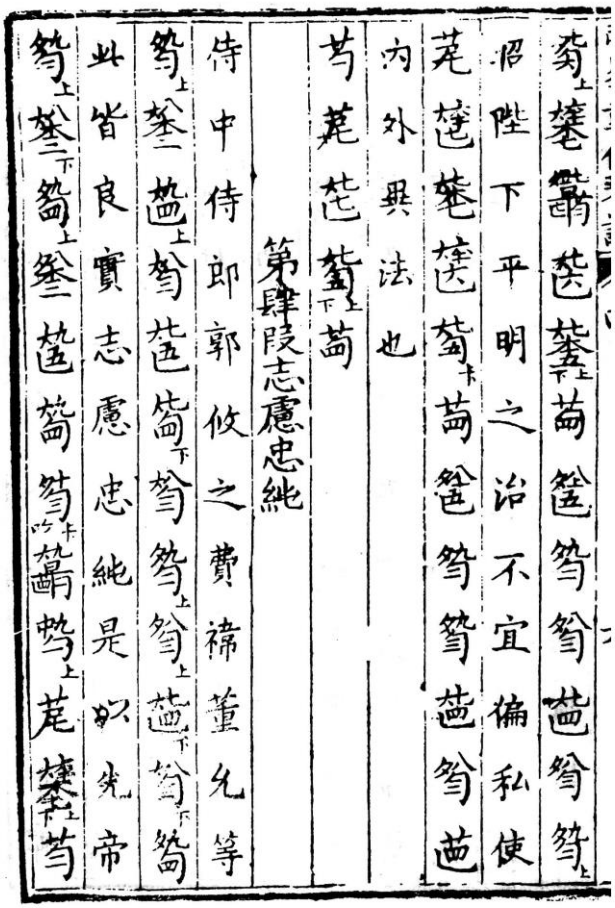


Fig. 2.4.1.6 Chóngxiū Zhēnchuán Qínpǔ, juan 4, folio 6B

To sum up, the basic and default form provided by OFF / OpenType should be the rightward single-line and 1/2 height form, and the typesetting software could implement the double-lines and 1/2 height form as the optional feature. On the other hand, the weight of the glyph used for the small-sized "character" is lighter than the big-sized "character" commonly, but this is not the issue for encoding works.

2.4.2. Horizontal layout

Although the horizontal layout is not the Chinese traditional layout, it was gradually used and accepted after 1909, especially after 1919 as the book *Jìndài Zhōngguó Shūyè de Fēifán Shídài: 1909-1937* shows (p. 193). Almost all the new typesetting publication of Jianzi scores have used the horizontal layout after 1949. There are eight types for the layout, which there are at least 1 element and at most 5 elements in the abstract "*yokochutate*" (横中縦, vertical in horizontal, not "*tatechuyoko*"/縦中横) typesetting box from the top to the end. When there are 1 element and 2 elements, the positions are for the form to stand on the baseline and the form to stand on the bottom side of the face, which some musicians call the later one is the sinking form. Few musicians sometimes include more than 5 elements in one box, such as *"Dàhuángé Qínpǔ" Yuè Quán*, which this book only shows the hand-written forms and is used for the special uses, so we exclude the situation for more than 5 elements for our encoding consideration. If any type designer and font developer hope expand to include more than 5 elements in their font and system, the current encoding model we provided in this document can cover.

2.4.2.1. Single-character form



Fig. 2.4.2.1 Example 1-1

As Fig. 2.4.2.1 shows, two red small-sized “characters” are both the single-character form for the horizontal layout, that means there is no other “character” above or below them. Please see the source in Fig. 2.4.2.2.

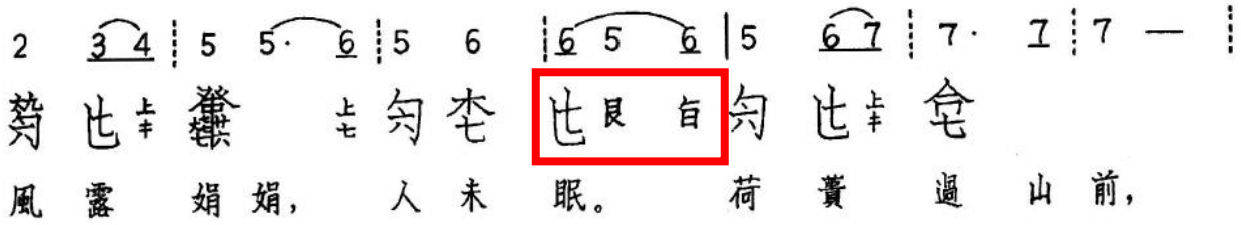


Fig. 2.4.2.2 Xiángē Yǎyùn, p. 111

This case means “to slide to the left by the left hand and then back to the right”.

2.4.2.2. Sinking single-character form

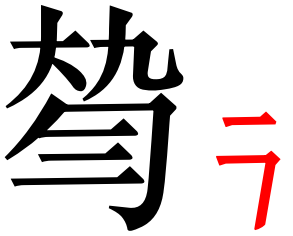


Fig. 2.4.2.3 Example 1-2

As Fig. 2.4.2.3 shows, the red small-sized “character” is the single-character form, but the location is lower than the previous one example, so we call this form as the sinking single-character form. Please see the source and location comparation between Examples 1-1 and 1-2 in Fig. 2.4.2.4.

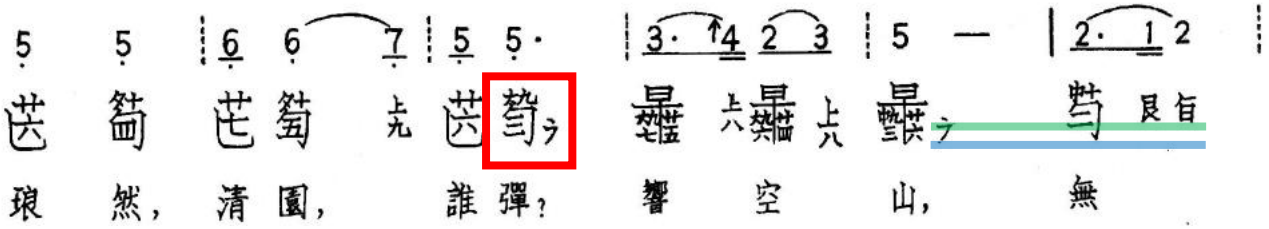


Fig. 2.4.2.4 Xiángē Yǎyùn, p. 111

This case means “to slide evenly to the left and right with an amplitude of about four or five millimeters by the left hand to get the effect of tremor”. The elements used for this form are not used for the previous form.

2.4.2.3. Double-characters form

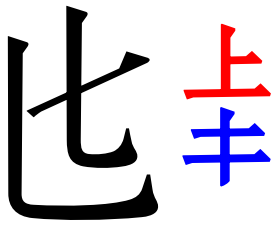


Fig. 2.4.2.5 Example 2-1

As Fig. 2.4.2.5 shows, the red and blue small-sized "characters" belong to the double-characters form together. The ordering is from the top to the bottom. (red → blue) Please see the source in Fig. 2.4.2.6.

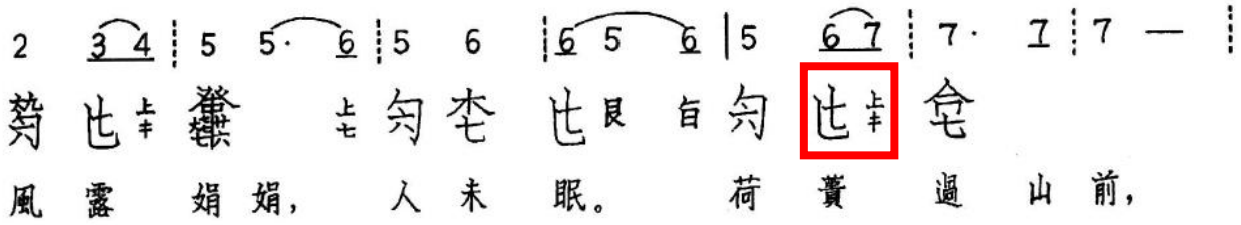


Fig. 2.4.2.6 Xiángē Yǎyùn, p. 111

In this case, the red one means "to slide to the right by the left hand", and the blue one is the marker.

2.4.2.4. Sinking double-characters form

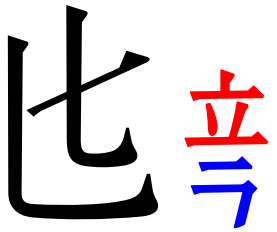


Fig. 2.4.2.7 Example 2-2

As Fig. 2.4.2.7 shows, the red and blue small-sized "characters" belong to the double-characters form together, but the location(s) is/are lower than the previous one example, so we call this form as the sinking double-characters form. The ordering is from the top to the bottom. (red → blue) The blue small-sized "character" in this case is the same as the red small-sized "character" of Example 1-2 for the semantic. The kind of the small-sized "character" like Example 1-2 will make the location of double-characters form more sinking, when they are used as the last element in this form, and the translucent blue line shows the bottoms of Examples 2-2 and 1-2 are in the same position. Please see the source in Fig. 2.4.2.6.

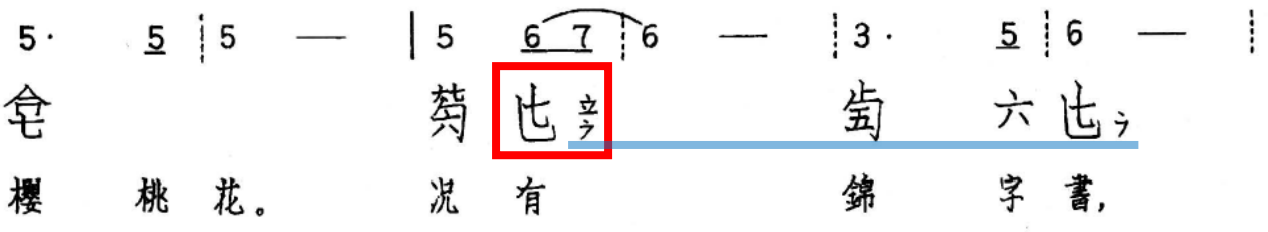


Fig. 2.4.2.8 Xiángē Yǎyùn, p. 107

This case means "to slide evenly to the right with an amplitude of about four or five millimeters by the left

hand to get the effect of tremor, and gradually stabilize in the original position".

2.4.2.5. Triple-characters form

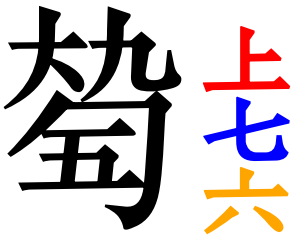


Fig. 2.4.2.9 Example 3

As Fig. 2.4.2.9 shows, the red, blue and orange small-sized "characters" belong to the triple-characters form together. The ordering is from the top to the bottom. (red → blue → orange) Please see the source in Fig. 2.4.2.10.

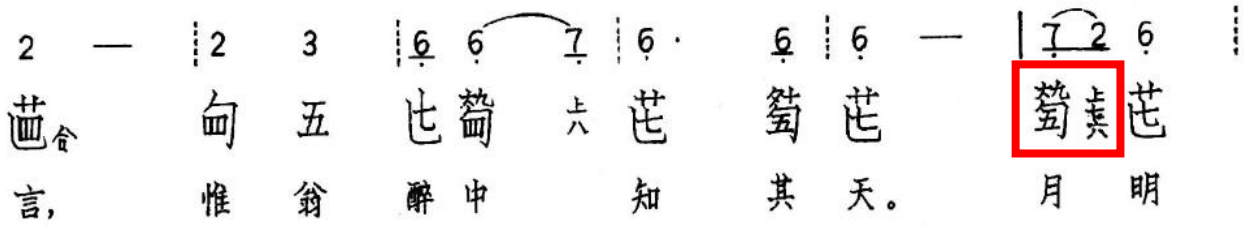


Fig. 2.4.2.10 Xiángē Yǎyùn, p. 111

In this case, the red one is the same as the red one in Example 2-1 for the semantic, and the blue and orange ones are the marker and sub-marker.

2.4.2.6. Quadruple-characters form

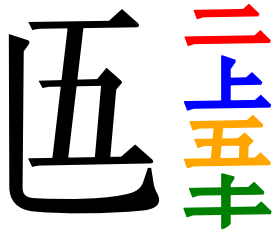


Fig. 2.4.2.11 Example 4

As Fig. 2.4.2.11 shows, the red, blue, orange and green small-sized "characters" belong to the quadruple-characters form together. The ordering is from the top to the bottom. (red → blue → orange → green) Please see the source in Fig. 2.4.2.12.

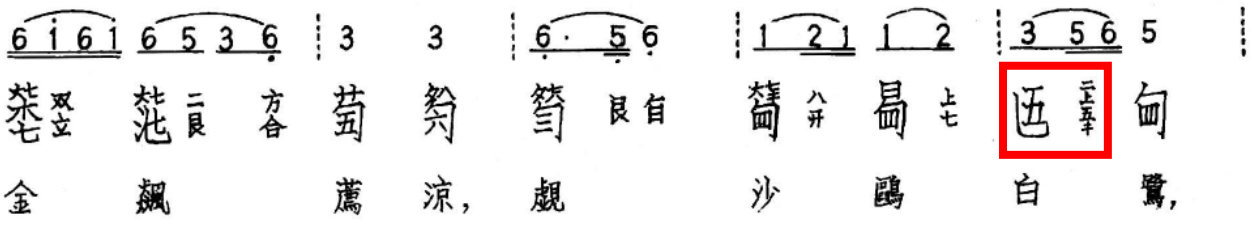


Fig. 2.4.2.12 Xiángē Yǎyùn, p. 93

In this case, the last three are similar to Example 3 for the semantics, and the red one means "twice".

2.4.2.7. Quintuple-characters form



Fig. 2.4.2.13 Example 5

As Fig. 2.4.2.13 shows, the red, blue, orange, green and purple small-sized “characters” belong to the quintuple-characters form together. The ordering is from the top to the bottom. (red → blue → orange → green → purple) Please see the source in Fig. 2.4.2.14.

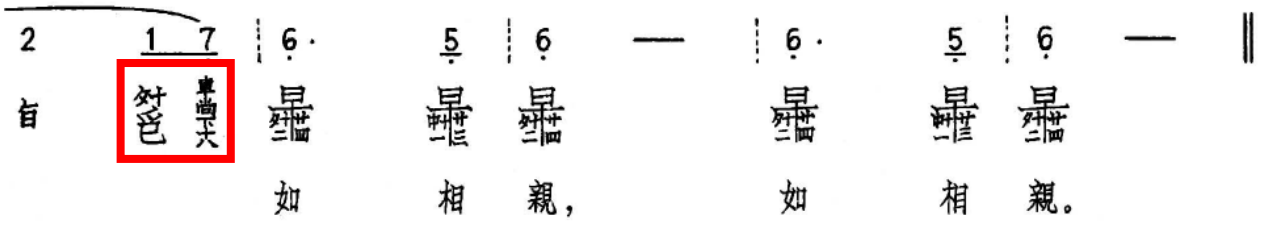


Fig. 2.4.2.14 Xiángē Yǎyùn, p. 184

In this case, the red one means “to pluck the string continuously”, the blue and orange ones mean “to drag to the next position before the previous one stops” together, and the green and purple ones are the marker and sub-marker.

2.4.2.8. Comparison

We put these seven examples together to make it easy to compare the differences of the layout structures in this section.

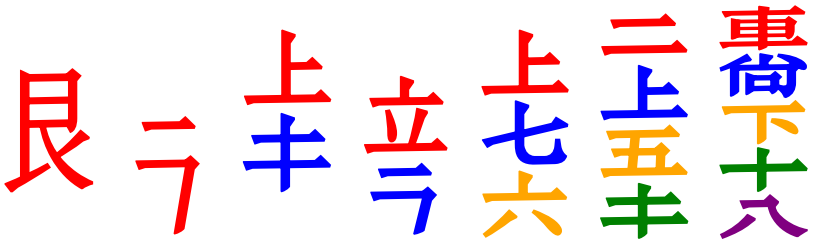


Fig. 2.4.2.15 Comparison of seven examples

To sum up, if the number of elements is less than or equal to 2 and the last element is used for the sinking forms, the location should be sinking; if not, the location should be natural. The sinking forms are just the modern academic conventions and used widely. If some books or future digital fonts don’t follow this convention that means the location of the elements in two sinking forms are the same as the corresponding non-sinking forms, they are also acceptable but not encouraged. As Fig. 2.4.2.16 shows, the second group of the small-sized “characters” stood on the transparent blue line should be the non-sinking double-characters form defined like Section 2.4.2.3, but this book shows the corresponding sinking form, which is not wrong but not the most proper.

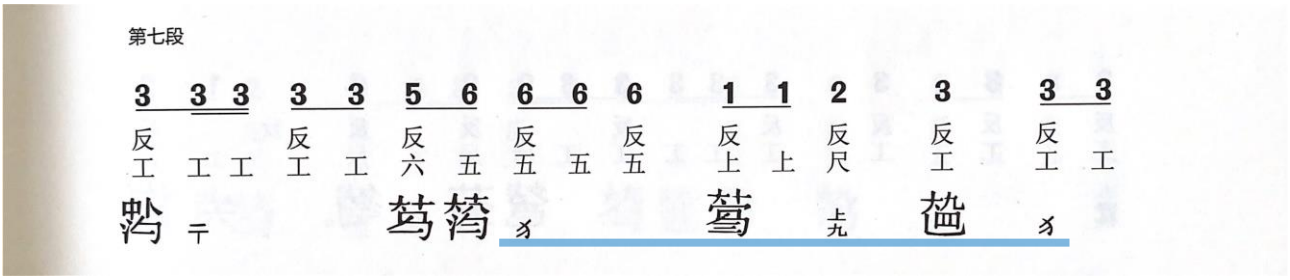


Fig. 2.4.2.16 Yáng Zōngjì "Qínxué Cóngshū" Qǔpǔ Shìyì, p. 305

2.4.3. Simultaneous usage

We found the interlinear explanatory note and the small-sized "character" could be used in the same line and at the same page. In the orange square of Fig. 2.4.3, the first vertical line from right to left is the lyric, the second vertical line is similar to the musical rhythm, the right part of the third vertical line is the Gongche Musical Notation without banyan (板眼), the left part is the string and some right-hand fingering of the Jianzi Musical Notation, the fourth vertical line is the Jianzi Musical Notation. In the fourth vertical line, the inverse part is the interlinear explanatory note which includes the editorial note, and the small-sized "character" is also shown as the common form.

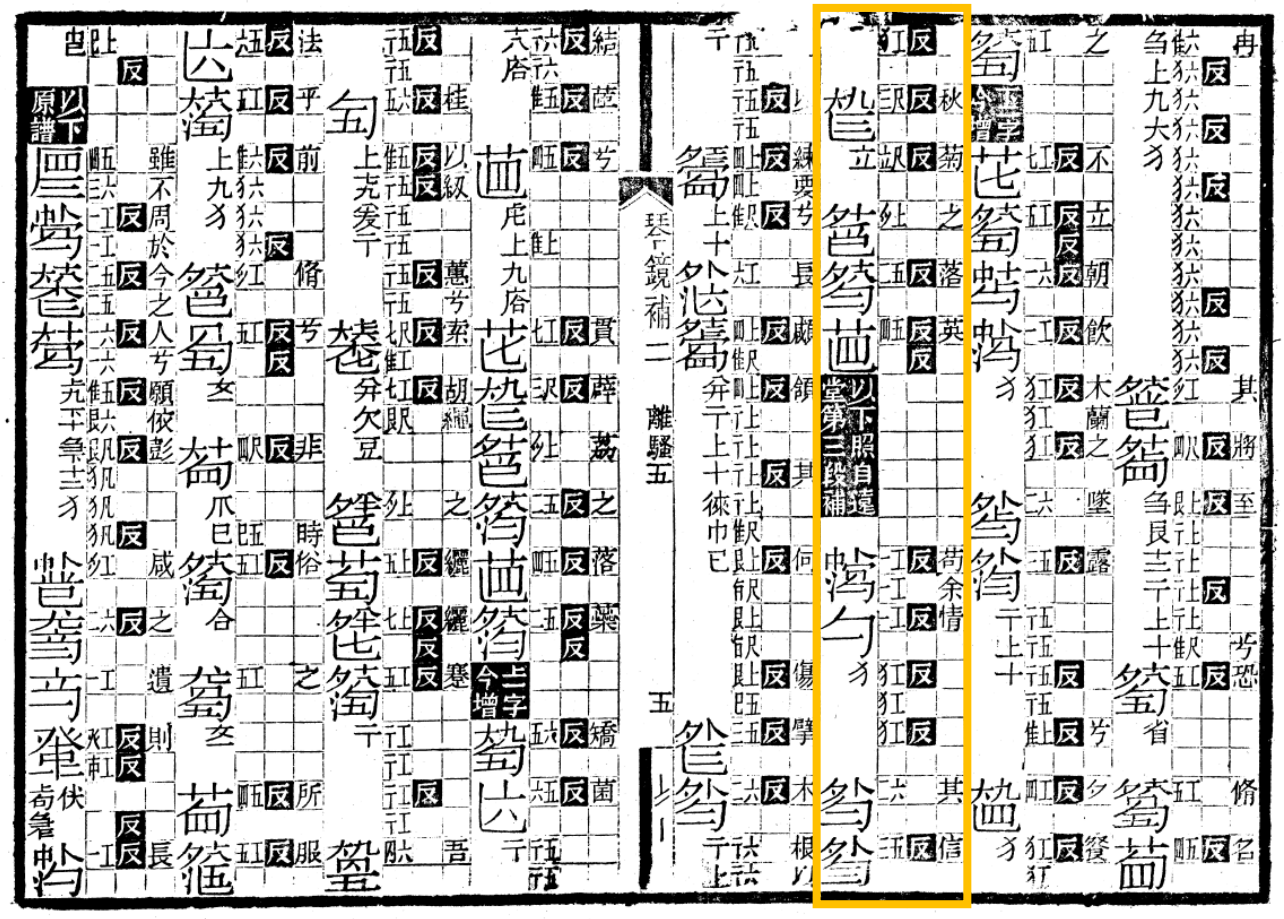


Fig. 2.4.3 Qínxué Cóngshū, Book 9, Qínjìngbǔ, Part 2, Lísāo, Part 5, folio 5

It means the interlinear explanatory note and the small-sized "character" are needed together for Jianzi Musical Notation, so there is no reason to confuse them as the same thing.

2.5. Ruby annotation "characters"

The ruby annotation "characters" here means 注字 (zhùzì) in Chinese. This part is not necessary in one running score. The situations of 39 publishing sources are shown as below.

Table 2.5 Information on ruby annotation "characters"

Used or not	**Amount**	**Books**
Not used	35 (89.74%)	太音大全集 [1413]、神奇秘譜 [1425]、梧岡琴譜 [1546]、西麓堂琴譜 [1549]、杏莊太音補遺續編 [1557]、琴譜正傳 [1561]、琴譜合璧 [1573]、重修真傳琴譜 [1585]、琴書大全 [1590]、藏春塢琴譜 [1602]、琴學彙粹 [1637]、澄鑒堂琴譜 [1686]、德音堂琴譜 [1691]、徽言秘旨訂 [1692]、蓼懷堂琴譜 [1702]、誠一堂琴譜 [1705]、立雪齋琴譜 [1730]、琴學練要 [1739]、東皋琴譜 [1771]、松風閣琴譜 (Siku version) [1792]、松弦館琴譜 (Siku version) [1792]、琴譜合璧 (Siku version) [1792]、自遠堂琴譜 [1802]、二香琴譜 [1833]、律話 [1833]、重刻律音彙考 [1835]、一經廬琴譜 [1845]、百瓶齋琴譜 [1856]、琴學入門 [1864]、蕉庵琴譜 [1868]、枯木禪琴譜 [1893]、十一弦館琴譜 [1907]、琴學叢書 [1911]、沙堰琴編 [1946]、風宣玄品 [unknown]
Used	4 (10.26%)	五知齋琴譜 [1722]、卧雲樓琴譜 [1722]、研露樓琴譜 [1766]、天聞閣琴譜 [1876]

In our research, there are 4 books with the ruby annotation "characters", and the ruby annotation "characters" are still not common in two of them. This part is used very commonly and only commonly in *Wǔzhīzhāi Qínpǔ* and *Tiānwéngé Qínpǔ*, which is also not common in the modern publications. In Figs. 2.5.1 and 2.5.2, the blue rectangle in Fig. 2.5.1 shows both are only Hanzi, others are some Jianzi elements are used among the Hanzi running texts. The red rectangles in Figs. 2.5.1 and 2.5.2 show "此段一氣車絡作一句彈" and "氣車絡" which "車" here used as one Jianzi element means "連"; the blue rectangle in Fig. 2.5.2 shows "爰起" which "爰" here used as one Jianzi element means "緩"; the green rectangle in Fig. 2.5.2 shows "此声要巠　脆滑仙音自得" which "声" here is the ancient vulgar variant of 聲 and it has been accepted as the PRC simplified form, and "巠" here used as one Jianzi element means "輕".



Fig. 2.5.1 Wǔzhīzhāi Qínpǔ, Book 3, juan 2, folio 24

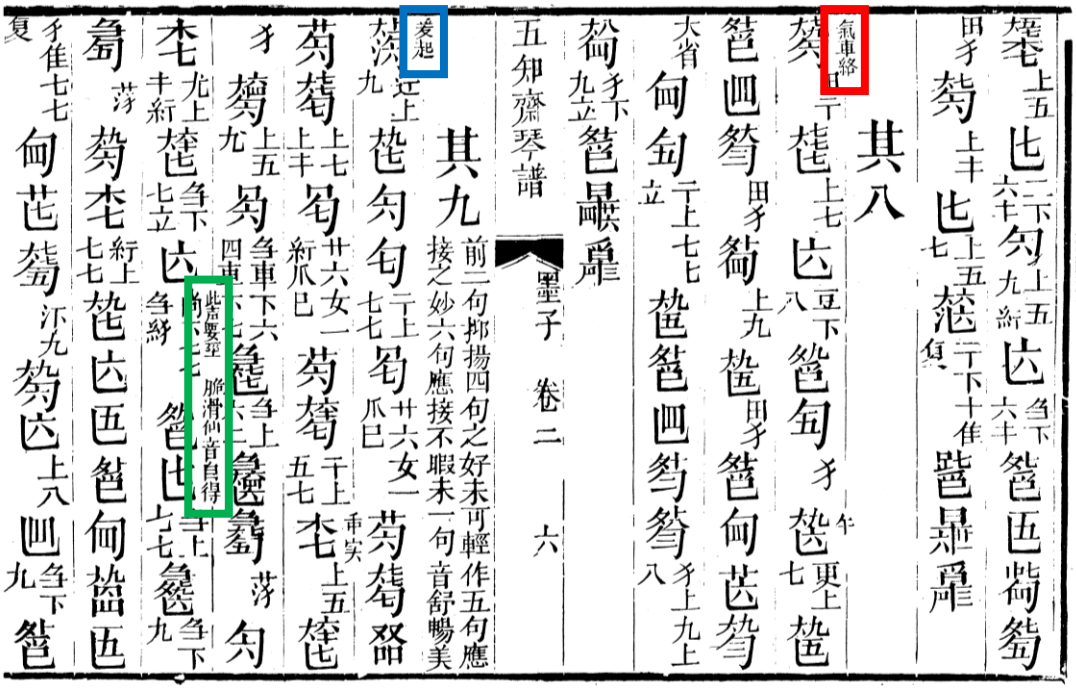


Fig. 2.5.2 Wǔzhīzhāi Qínpǔ, Book 3, juan 2, folio 6

To sum up, the elements used for the ruby annotation “characters” could be all free for all the CJKUIs, and this is like the common ruby annotation behavior for East Asian digitization. Therefore, this is not a new duty for UCS / Unicode commonly.

2.6. Punctuation-like symbols

There are two and only two punctuation-like symbols used in the Jianzi scores.

Table 2.6 List of punctuation-like symbols

。	°	「	⌟
rest symbol		repeat sign	

The first one is the rest symbol as the blue circle shows in Fig. 2.6.1, that the shape and the location are the same as the ideographic full stop (U+3002 。 *or* U+FE12 °) in the vertical layout. This symbol must not be used in the start of a score and a visual line but could be used in the end.

The other one is the repeat sign as the dark red circle shows in Fig. 2.6.1, that the shape and the location are the same as the left corner bracket (U+300C 「 *or* U+FE41 ⌟) in the vertical layout. There must be some small-sized "characters" used after this symbol as the orange rectangle shows in Fig. 2.6.1. This symbol must not be used in the end of a score and a visual line but could be used in the start. If it is used in the running score, the previous one should be the rest symbol commonly.

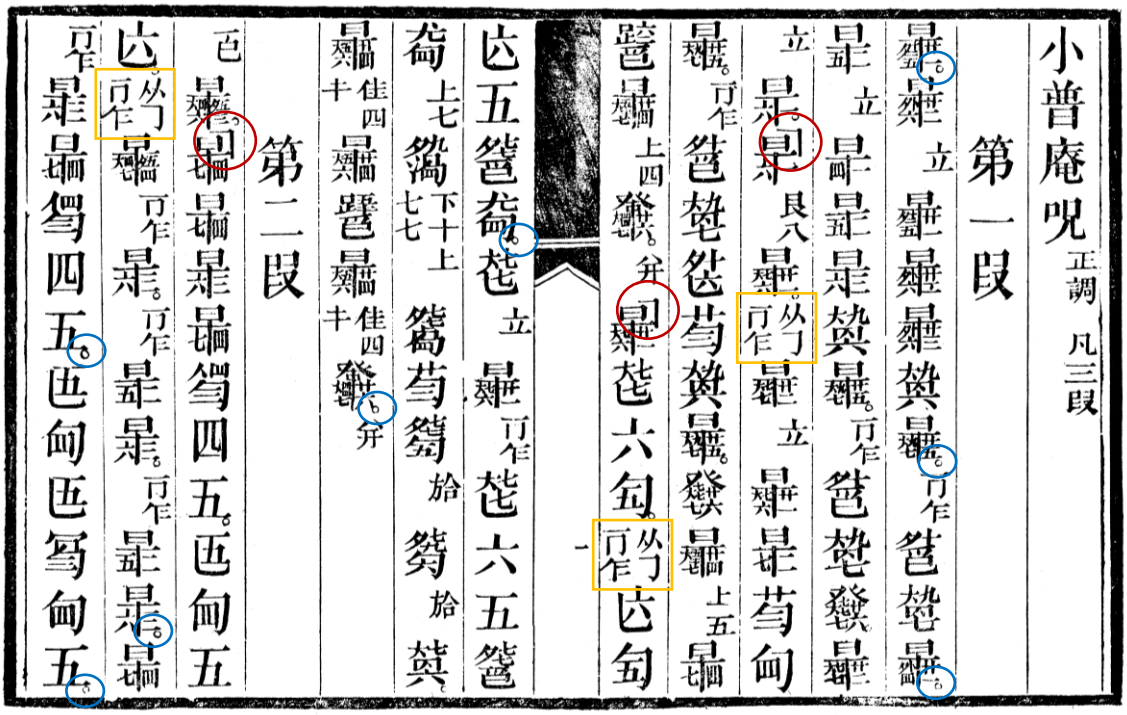


Fig. 2.6.1 Shíyīxiánguǎn Qínpǔ

The following shows one example of the modern horizontal layout. Please see Fig. 2.6.2. Some modern musicians only use the repeat sign in the running scores because the corresponding synchronous numbered musical scores or Western / staff musical scores have been showed the resting positions. Please see Fig. 2.6.3.

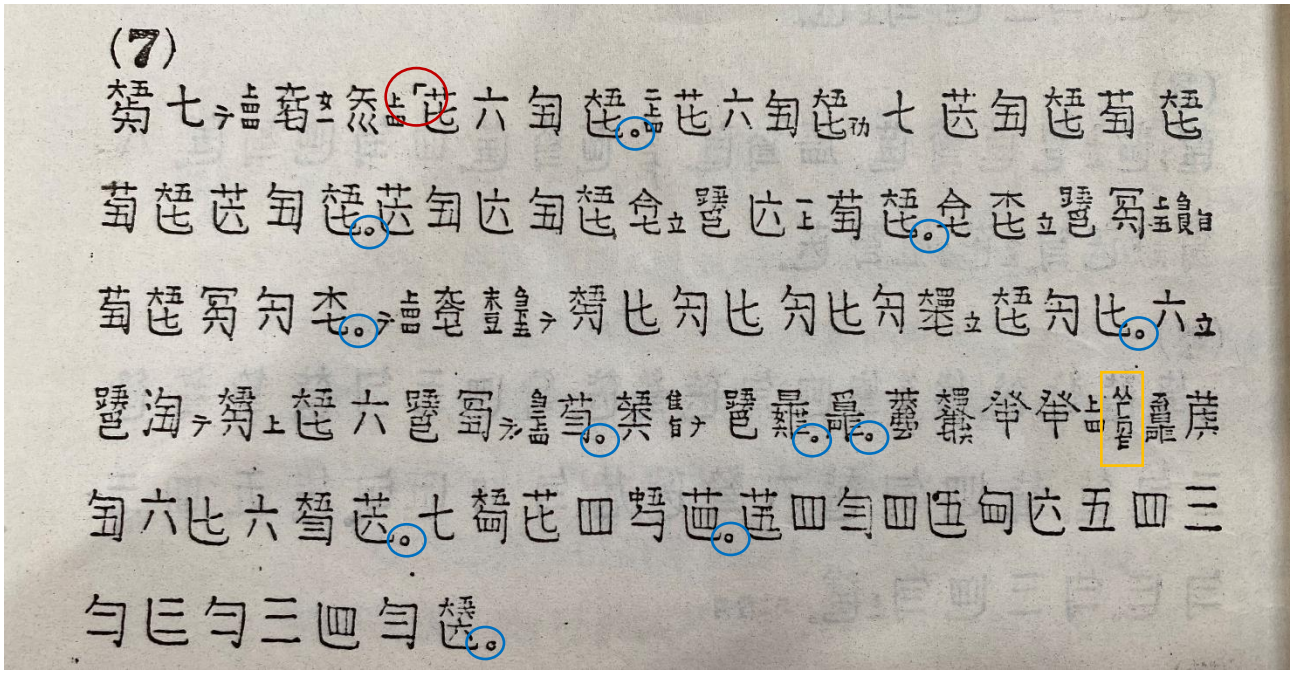


Fig. 2.6.2 Gǔqín Chūjiē, p. 72

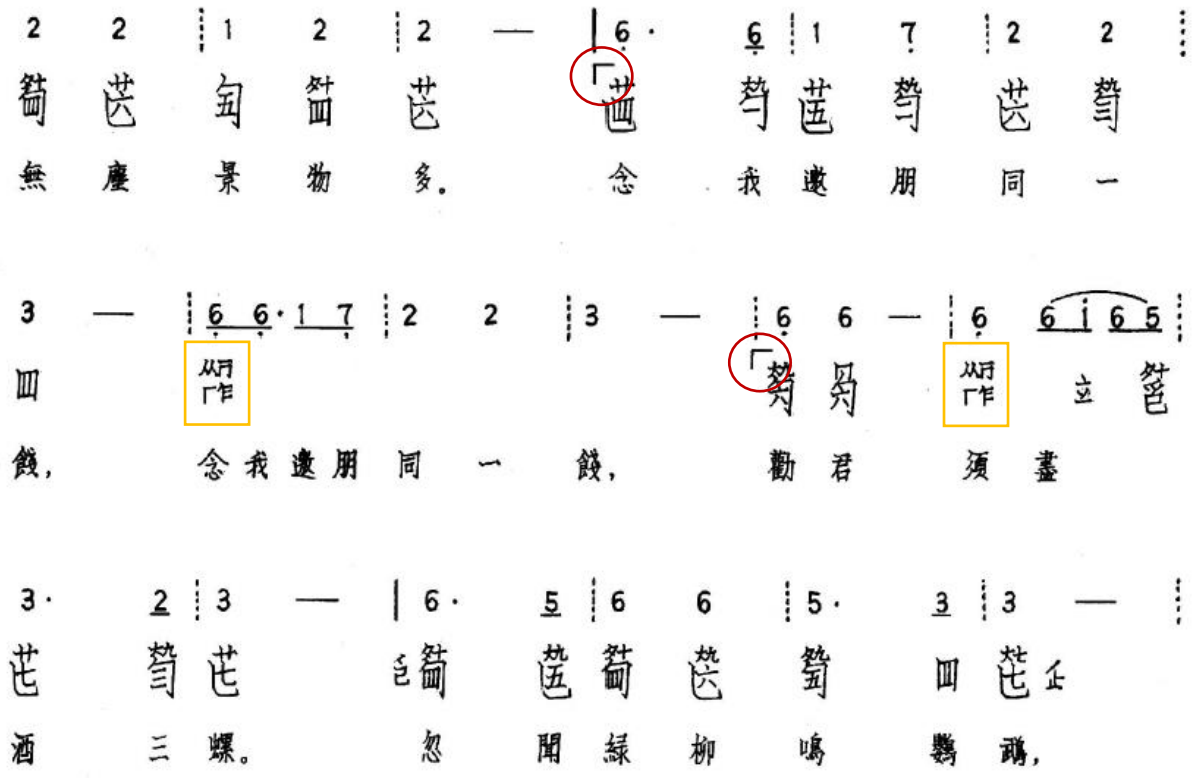


Fig. 2.6.3 Xiángē Yǎyùn, p. 26

2.7. General comment

As the previous pictures show, the vertical and horizontal layouts of Jianzi scores are not used as the simple texts in general, but it could be typeset and rendered as plain texts for the simple texts. As ISO/IEC TR 15285:1998 shows, “An intelligent font can be used with a layout and presentation process that directly

presents coded characters, that is, plain text (a coded character sequence that does not contain additional formatting information).” (p. 20) Therefore, the elements of the Jianzi Musical Notation are suitable for encoding and used for the plain texts, and the end users could typeset them with other scripts and typesetting features supported by the typesetting software.

3. Encoding details

This part will show how to make the clusters composed orderly from the elements.

3.1. Full table of the Jianzi Fingering Letters

In this part, we will show three tables on the Jianzi Fingering Letters mapped to the encoded CJKUI, the ones mapped to the CJKUI included in the IRG WS2021 and the unencoded ones with the several new provisional Unihan properties.

Before listing the tables, we need to clarify the new Unihan provisional properties, which are `kJianziName`, `kJianziVariant`, `kJianziMandarin`, `kJianziCantonese` and `kJianziNumeric`. We have also prepared the related reading properties for Zhuang (*Vahcuengh*, ISO 639-3 code is `zha`) and Bouyei (*Haausqyaix*, ISO 639-3 code is `pcc`) languages, but there have not been the corresponding properties for the basic characters on Unihan Database yet, that means it is very hard for the Unihan experts to review them, so we decided not submitting `kJianziZhuang` and `kJianziBouyei` properties at this time. Lee Collins once showed a Vietnamese modern published books on the Chinese poetry written by Vietnamese poets to Eiso, which includes the Jianzi musical score for Guqin as well, such as 𢆶 reads tán thiêu lục, 尻 reads phách lục in modern Vietnamese (*Tiếng Việt*, ISO 639-3 code is `vie`). We could consider adding `kJianziVietnamese`, even `kJianziJapanese` properties in future if needed, but we also need to think about how to handle the Vietnamese syllable and word separation rule here.

The following table provides the fields for the `kJianziName` property as reflected in UAX #38. It is marked as "**P.I**" in the Tables 3.1.1 through 3.1.3.

Field	**Text**
Property	kJianziName
Status	Provisional
Category	Readings
Introduced	*TBD*
Delimiter	space
Syntax	[\x{3400}-\x{4DBF}\x{4E00}-\x{9FFF}\x{FA0E}\x{FA0F}\x{FA11}\x{FA13}\x{FA14} \x{FA1F}\x{FA21}\x{FA23}\x{FA24}\x{FA27}-\x{FA29}\x{20000}-\x{2A6DF} \x{2A700}-\x{2EE5F}\x{30000}-\x{323AF}]{1,3}
	\p{Unified_Ideograph}{1,3}
	[\x{3400}-\x{4DBF}\x{4E00}-\x{9FFF}\x{20000}-\x{2A6DF}\x{2A700}-\x{2B73F} \x{2B820}-\x{2EBEF}]{1,3}
Description	The name of Jianzi Fingering Letter is the original source of the fingering commonly. Almost all the letters have the corresponding names, and the musicians and instrumentalists call the letters based on the names. One property value includes one to three CJKUIs. The values could be used for zh-Hans-CN, zh-Hant-CN, zh-Hant-HK, zh-Hant-MO, zh-Hant-TW and ja-Hani-JP.

Note: As Eiso's comment on WS2021-01460:SAT-05590 (𥑮去𠂉手), this character could be used in one Guqin fingering in *Orchid in Seclusion*, and this fingering has been later inherited. When this character is encoded in UCS / Unicode, we need to update the property and the corresponding property value. There are three kinds of syntax here. We should choose the best one. In the property values, we used 362 ideographs, 2 for Ext. A, 2 for Ext. B, 1 for Ext. C, 2 for Ext. E, 1 for Ext. F and 354 for URO. During the review works of kFanqie property on PRI #483, Richard Cook mentioned the syntax is not better to include all the encoded CJKUI, and then Ken Whistler, Ken Lunde, Lee, Eiso and Kushim discussed this issue.

The following table provides the fields for the `kJianziVariant` property as reflected in UAX #38. It is

marked as "**P.II**" in the Tables 3.1.1 through 3.1.3.

Field	**Text**
Property	kJianziVariant
Status	Provisional
Category	Variants
Introduced	*TBD*
Delimiter	space
Syntax	U\+[23]?[0-9A-F]{4}
Description	One fingering has not only one Jianzi Fingering Letters. The property value shows the special semantic variants when this character is used as Jianzi Fingering Letter. All the characters used in the values must also be used as Jianzi Fingering Letter.

Note: There are so many unencoded listed in Table 3.1.3, so we just use the form `&nnn;` temporarily, which `nnn` means the serial number in Tables 1.1.1 and 3.1.3.

The following table provides the fields for the `kJianziMandarin` property as reflected in UAX #38. It is marked as "**P.III**" in the Tables 3.1.1 through 3.1.3.

Field	**Text**
Property	kJianziMandarin
Status	Provisional
Category	Readings
Introduced	*TBD*
Delimiter	space
Syntax	[a-z\x{300}-\x{302}\x{304}\x{308}\x{30C}]+
	[a-z\x{E0}-\x{E1}\x{E8}-\x{E9}\x{EC}-\x{ED}\x{F2}-\x{F3}\x{F9}-\x{FA}\x{FC} \x{101}\x{113}\x{11B}\x{12B}\x{14D}\x{16B}\x{1CE}\x{1D0}\x{1D2}\x{1D4} \x{1D6}\x{1D8}\x{1DA}\x{1DC}]+
Description	The pīnyīn reading for this character when it is used as Jianzi Fingering Letter. The value could include more than one pīnyīn syllable without space. The values could be used for zh-Hans-CN, zh-Hant-CN and zh-Hant-TW.

Note: The word separation rule follows GB/T 16159-2012 *Basic rules of Chinese phonetic alphabet orthography* and Section 10 of ISO 7098:2015 *Information and documentation — Romanization of Chinese* basically. There are two kinds of syntax here. We should choose the best one.

The following table provides the fields for the `kJianziCantonese` property as reflected in UAX #38. It is marked as "**P.IV**" in the Tables 3.1.1 through 3.1.3.

Field	**Text**
Property	kJianziCantonese
Status	Provisional
Category	Readings
Introduced	*TBD*
Delimiter	space
Syntax	[a-z1-6]+
Description	The Jyutping reading for this character when it is used as Jianzi Fingering Letter. The value could include more than one Jyutping syllable without space. The values could be used for yue-Hans-CN, yue-Hant-CN, yue-Hant-HK and yue-Hant-MO.

Note: Eiso once discussed the word separation rule for Jyutping used in this property with Dr. Kwan Hin Cheung and other LSHK experts, the method descripted as below is acceptable for them. Please also see

Section 2.3 of *An Overview to the Phonetic Transcription Scheme of Chinese Yue-dialect*. We also need to consider other comments on how to handle the word separation rule from UTC experts, especially from the experts in CJK & Unihan Group.

The following table provides the fields for the `kJianziNumeric` property as reflected in UAX #38. It is marked as "**P.V**" in the Tables 3.1.1 through 3.1.3.

Field	**Text**
Property	kJianziNumeric
Status	Provisional
Category	Numeric Values
Introduced	*TBD*
Delimiter	N/A
Syntax	[0-9]{1,2}
Description	Only one value of the character when it is used as the marker, sub-marker, string or pure numeral of Jianzi Fingering Letter. The property inherits the kPrimaryNumeric values from 1 to 10. The character and the value are bound uniquely.

Note: For one character, there is one and only one value at most; for one value, there is one and only one corresponding character. The approximate sub-marker and string will not have the value.

The following table shows all the CJKUIs used as the Jianzi Fingering Letters, that means these ones are identified to the encoded characters clearly. Some Jianzi Fingering Letters are also inherited as the fingering signs of other musical notations of Chinese folk musical instruments, but the essential meanings could be replaced to match the corresponding musical instrument more. GB/T 16431-2008 *China braille musical signs* is a Chinese national standard to collect so many fingering signs of the musical notations of different musical instruments. As Fig. 3.1.1 shows, this standard also uses the CJKUI as the fingering signs.

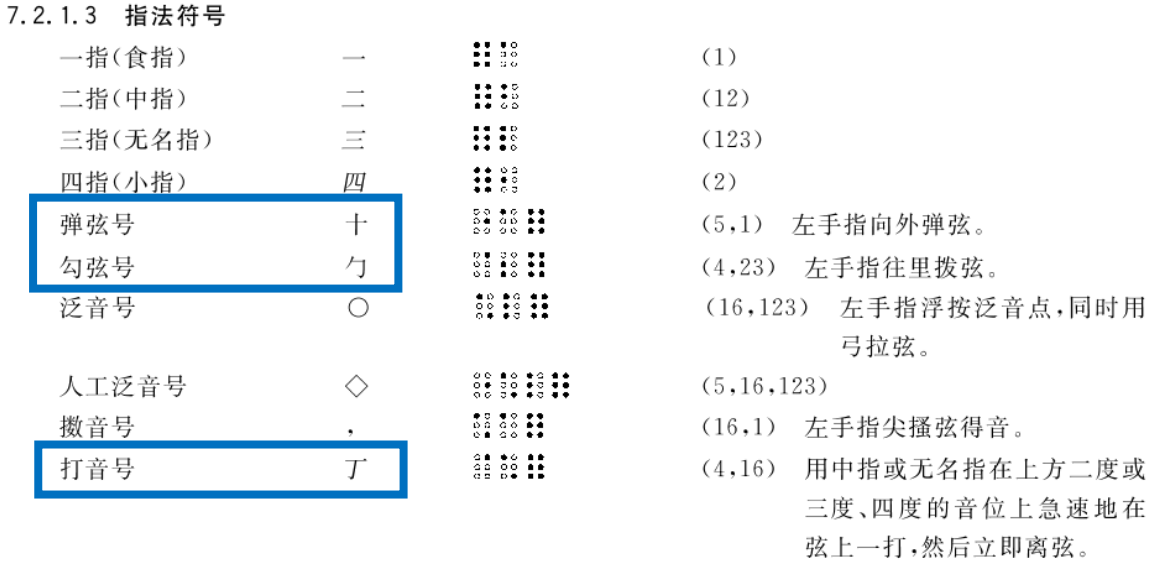


Fig. 3.1.1 GB/T 16431-2008, China braille musical signs, p. 19

We just show the examples of the following three tables here. Please see the complete versions in Appendix A, B and C. "Big" here means the types of elements used in the big-sized "characters", which are mentioned in Table 2.3; "Small" here means if the character could be used as the element in the small-sized "characters", which the only one mark is Y.

Table 3.1.1 (Examples of) full table of the Jianzi Fingering Letters mapped to the encoded CJKUI

UCS	Char.	Big	Small	P.I	P.II	P.III	P.IV	P.V
U+4E00	一	MNS	Y	一徽 一分 一弦 一次 一		yīhuī yīfēn yīxián yīcì yī	jat1fai1 jat1fan1 jat1jin4 jat1ci3 jat1	1
U+4E0A	上	MO	Y	上		shàng	soeng6 soeng5	
U+4E24	两		Y	两 兩 両	U+5169 兩	liǎng	loeng5	
U+4E3B	主	A	Y	注	U+6C35 氵 U+6CE8 注	zhù	zyu3	
U+5341	十	MN	Y	十徽 十		shíhuī shí	sap6fai1 sap6	10
U+5344	卅	A	Y	散		sǎn	saan2	
U+535C	卜	A	Y	绰 綽	&056;	chuò	coek3	
U+56DB	四	MNS	Y	四徽 四分 四弦 四		sìhuī sìfēn sìxián sì	sei3fai1 sei3fan1 sei3jin4 sei3 si3fai1 si3fan1 si3jin4 si3	4
U+5927	大	LS	Y	大指 大弦 大		dàzhǐ dàxián dà	daai6zi2 daai6jin4 daai6	
U+5C38	尸	C		擘 劈 擗		bò pī	maak3 pik1	
U+5DE0	巠		Y	轻 輕 軽	U+5723 圣 &004;	qīng	hing1	
U+6C35	氵	A	Y	注	U+4E3B 主 U+6CE8 注	zhù	zyu3	
U+206A4	𠚤	C		𠚤				
U+27FB7	𧾷	L	Y	跪指 跪	U+20BC1 𠂤	guìzhǐ guì	gwai6zi2 gwai6	
U+2C09B	𠦂	C		撮	U+65E9 早	cuō	cyut3	

Explanation on the above exemplification:

1) For 一 (U+4E00), MNS in “Big” means it could be used as the marker, sub-marker, pure numeral for time and string in the big-sized “characters”; Y for “Small” means it could be used in the small-sized “characters”;

there are five values in “P.I”, which correspond to the marker, sub-marker, string, time and the concise name, and the Chinese Mandarin and Cantonese readings all correspond to the names. In general, the readers and the users could choose the complete or concise name, when the meaning is clear and correct.

2) For 上 (U+4E0A), M in “Big” means it could be used as the sub-marker in the big-sized “characters”, “O” means it could be used as the other fingering. There is one value in “P.III”, but two values in “P.IV”. As Eiso showed the fanqie of 上 (U+4E0A) in L2/23-002R, 時掌切 is for the rising tone which the corresponding Cantonese reading is soeng5 matched the sub-marker use, and 時亮切 is for the departing tone which the corresponding Cantonese reading is soeng6 matched the other fingering use, but the rising tone with the voiced initial consonant has been merged to the departing tone in Putonghua, that means the Mandarin reading for the sub-marker and other fingering uses are both the same. On the other hand, the specific pressing position for the musical scale between two markers is approximate, which is not a precise value, so there is no value for the `kJianziNumeric`.

3) For 两 (U+4E24), there are three values in “P.I” but single values in “P.III” and “P.IV”, 两 (U+4E24) for the simplified Chinese conventions, 兩 (U+5169) for the traditional Chinese conventions, and 両 for the modern Japanese conventions. Yifan and Eiso had proposed to add the `kOtherNumeric` for 两 (U+4E24) as 2 in L2/22-223, but this one is not used for the marker, sub-marker, string and pure numeral for time, that means there will not be value in “P.V”. 2 for “P.V” should be used for 二 (U+4E8C).

4) See subsection 12 as below.

5) For 十 (U+5341), there are only MN in “Big” not C. In Fig. 3.1.1, the standard use 十 (U+5341) to indicate the fingering, because there is no need to distinguish the numeric value representing 10 and other fingering in the modern use for other Chinese folk musical instruments. However, we have a strong need to distinguish the marker, pure numeral for time representing 10 and the core fingering meant “to pluck two or more strings with different right-hand fingering letters at the same time”; the former is derived from CJKUI 十 (U+5341) and the latter is derived from 撮 (U+64AE) which the individual glyph is stable to make the horizontal stroke higher like 𠀇 (U+2C09B).

6) For 卄 (U+5344), the individual glyph is like 卄 (U+5344) in some books, 3-stroke form of 艹 (U+8279). The actual glyph for this fingering is derived from the top left component of 散 (U+6563) which the original form 林 (U+6797) in Shuowen (THX-03015), and 4-stroke form of 艹 (U+8279) is also part of fingering 蕩吟 and 蕩猱, but 蕩 will be not shown as the individual glyph. Therefore, 卄 (U+5344) will be better for this fingering. As Eiso noted in 1.4 of IRGN2540, the Sanban sign shares the etymological source with this fingering, and the current glyph for this fingering is the same as Glyph form 1 mentioned in Table 0.1 of L2/22-207R.

7) For 𠂉 (U+535C), there are two forms in the ancient books which are both common, but the following left one is kept in the modern books, not the right one. The glyph for the left one like 𠂉 (U+2E8A) more than 卜 (U+535C), but we hope to keep all the fingering letter unify with the CJKUI not the CJK radicals. On the other hand, the most common form is related to the left one when this fingering is used as a part of a big-sized “character”. Note that 𠂉 (U+2E8A) has the equivalent CJKUI as 卜 (U+535C) in UCD.

	
Yījīnglú Qínxué, juan 2, folio 3	*Huīyán Mìzhǐdìng*, juan 1, folio 9

8) For 四 (U+56DB), all the individual glyphs in the ancient books are like 四 (U+56DB) that means the inside part is like 儿 (U+513F), but the most common form of the inside part should be changed to parallel

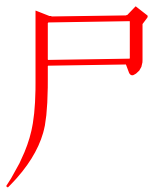
vertical stroke when it is used in one big-sized “character”. Please see the following. Therefore, we choose to unify to 四 (U+56DB) not 罒 (U+7F52), which the meaning matches 四 (U+56DB) more than 罒 (U+7F52).

			
Huīyán Mìzhǐdìng, juan 6, 烏夜啼, folio 3		*Yījīnglú Qínxué*, juan 2, folio 11	

For “P.III” and “P.IV”, there are four Mandarin readings, but eight Cantonese readings. The reason is that we keep the literary reading (文读) and colloquial reading (白读) for 四 (U+56DB) in Cantonese. If the colloquial reading is more common than the literary reading in Cantonese in the daily life, we keep both two readings, otherwise we only keep the literary reading.

9) For 大 (U+5927), LS in “Big” means it could be used as the left-hand fingering and string. This is the only one character could be both used as the left-hand fingering and string. The specific string for the musical scale is approximate, which is often to pluck the first string, so it has not the `kJianziNumeric` value.

10) For 尸 (U+5C38), the glyph for this fingering is cut from the outside component of the left top part of the following left Hanzi, which is shown as red. And there are other Hanzi used as the fingering names of this fingering, but they also include the component like the glyph of 尸 (U+5C38) in the ideographic structure, that means the fingering letter is derived from a cutting part of the corresponding Hanzi, so the fingering letter should be unified with the individual ideograph of the cutting part without any doubt.

	
Hanzi	Jianzi Fingering Letter

Mr. Richard Hsieh once submitted an error report to disunify 丰 (U+4E30) to two separate characters as IRGN2539 shows. CJK & Unihan Group discussed this issue and sent the report to IRG, and then Kushim and HKSAR provided the feedbacks. The simplified 丰 (U+4E30) is derived from the inside component of the upper part of 豐 (U+8C50), so the simplified 丰 (U+4E30) must be unified with the individual ideograph of the cutting part, despite 丰 (U+4E30) is also other character with different meaning as the traditional Hanzi and the first stroke is the horizontal one (FS=1) or the slash one (FS=3). The evolution from Hanzi to Jianzi is similar to the simplification from the traditional Hanzi to the simplified one to a certain degree. On the other hand, there are two Mandarin readings and two Cantonese readings for this fingering letter. In fact, pī and pik1 could be used with 擘, 劈 and 擗, but bò and maak3 is only used with 擘 and 擗, and the Guqin musicians always write 擘 with reading pī and pik1.

11) For 巠 (U+5DE0), it has the variant as 巛 (&004;), but 巛 (&004;) could be used as the additional fingering letter in the big-sized “character” and one part in the small-sized “character”, and 巠 (U+5DE0) could only be used as one part in the small-sized “character”. One fingering name or a group of fingering names could correspond to different fingering letters. Commonly, the usages for the fingering letters which share the same names could be different, and we will list all information clearly in the table.

12) For 氵 (U+6C35), it is more common than 主 (U+4E3B) with the same names and the same usages. The

fingering name of these fingering is 注, and 氵 (U+6C35) is derived from the left cutting component, 主 (U+4E3B) is derived from the right cutting component.

13) For 々 (U+206A4), this is really an iteration mark with the same glyph as U+3005 (々), but this one should be used as a part in the clusters, and the general category of U+3005 (々) is Lm not Lo like other CJKUI, so we think it is better to use 々 (U+206A4). This situation is similar to the iteration mark in Khitan small script, 𘬀 (U+18B00) like Section 2 of WG2 N4905 shows. The only one source reference for 々 (U+206A4) is GFZ-FCA2 and no IRG expert provides any other new evidence after IRG #49, so we can know it is the ideographic form of the iteration mark based on Fig. 2.35 of IRGN2245 shows, that is the best choice for this fingering letter. The real reading in the running scores is confirmed based on the previous fingering letter, so we just use itself as the name and keep the Mandarin and Cantonese readings empty.

14) For 𫝀 (U+27FB7), the individual glyph is like WS2021-01907:SAT-10320 (⿰口止) more than current J4-7939 and VN-27FB7 glyphs for 𫝀 (U+27FB7). If IRG decides to not unify WS2021-01907 to 𫝀 (U+27FB7) finally, we will change mapping to the new code point, but now it is better to keep this fingering letter here.

Table 3.1.2 Full table of the Jianzi Fingering Letters mapped to the CJKUI included in IRG WS2021

WS SN	Glyph	Big	Small	P.I	P.II	P.III	P.IV	P.V
00375	夲	C		索铃 索鈴 索轮 索輪		suǒlíng suǒlún	sok3ling4 saak3ling4 sok3leon4 saak3leon4	
01252	庶	C	Y	度 渡	U+5E7F 广	dù	dou6	
03060	緟	C		曲终 曲終	&102;	qǔzhōng	kuk1zung1	
03766	詶	C		调终 調終	U+7DA2 綢 &074;	diàozhōng	diu6zung1	

1) For 夲 (WS2021-00375), there are four names as two groups, the first two often correspond to this glyph commonly, and the last two often correspond to another glyph as 杏 commonly, which should be unifiable based on the same usages.

2) For 庶 (WS2021-01252), the SAT-Submitted glyph in WS2021 is ⿰广廿, and there is no UCV to unify two glyphs, but there is no barrier to encode them separately now. However, we don't want to do like this. The SAT-Submitted one is derived from the outside part of 席, and this one is derived from the outside part of 度, so they are both related to 庶, that means it is the best to unify them. We also suggest IRG add this pair to UCV for the future uses.

3) & 4) No more explanation.

Table 3.1.3 (Examples of) full table of the Jianzi Fingering Letters mapped to the unencoded characters

SN	Glyph	Big	Small	P.I	P.II	P.III	P.IV	P.V
4	巠	A	Y	轻 輕 軽	U+5723 圣 U+5DE0 巠	qīng	hing1	
5	丐	C		打摘		dǎzhāi	daa2zaak6	
9	詮	C		三弹 三彈 三弹	&011;	sāntán	saam1taan4	

SN	Glyph	Big	Small	P.I	P.II	P.III	P.IV	P.V
15	𠃊	C		捻轮 捻輪 夹弹 夾彈 夾弾		niǎnlún jiātán jiátán	nan2leon4 gaap3taan4 gip6taan4 gep6taan4	
32	弁		Y	分开 分開		fēnkāi	fan1hoi1	
42	囹		Y	同合		tónghé	tung4hap6	
53	卡	M	Y	十一徽 十一		shíyīhuī shíyī	sap6jat1fai1 sap6jat1	11
56	卜	M	Y	徽外 外 外徽		huīwài wài wàihuī	fai1ngoi6 ngoi6 ngoi6fai1	14
76	夲	A		大注		dàzhù	daai6zyu3	
81	𡗗	C		大序终 大序終		dàxùzhōng	daai6zeoi6zung1	
122	𠫓	C		倚蠲 倚涓 倚捐 摘打蠲 摘打涓 摘打捐		yǐjuān zhāidǎjuān	ji2gyun1 zaak6daa2gyun1	

1) For 巛 (&004;), it is related to 11) under Table 3.1.1. 巛 (&004;) could be used as the additional fingering letter in the big-sized "character", but 巠 (U+5DE0) not.

2) For the glyph of 𠫓 (&005;), it is compounded by 丁 (U+4E01) derived from 打 (U+6253) and 亏 (&017;) derived from 摘 (U+6458). The meaning is 丁 (U+4E01) "to pluck the string inward with the ring finger" and then 亏 (&017;) "to pluck the string outward with the ring finger", that means the players should pluck the same string inward and then outward both with the ring finger for the same left-hand finger and markers when they see this fingering letter. This kind of fingering letter is often used in Type 1 of the big-sized "characters" as the core fingering letter and the following string must be only one group, which is different from Type 2, because there will be two core fingering letters. This kind is treated as a whole fingering, so it is better to encode them separately.

3) For 𠄡 (&009;), the top component means "three times", but we keep it separately for the technical reasons mainly. In general, the numerals can't be treated as the additional fingering letters, because it will be confused with the markers when the users read the corresponding big-sized "characters" to understand. On the other hand, it means "to pluck the string outward with ring finger, middle finger and then index finger continuously", that is similar to the previous one, so it is OK to encode it separately.

4) For the glyph of 𠃊 (&015;), it is compounded by 乚 (U+4E5A) "to pluck the string outward with the index finger" and 尸 (U+5C38) "to pluck the string inward with the thumb", and the real meaning is also related to these two component as "to pluck the string(s) outward with the index finger and then inward with the thumb continuously and quickly", but its fingering name is not compounded by the fingering names of two components, which is the new ones, because it is a whole fingering letter.

5) For the glyph of 弁 (&032;), it could be unified to 并 (U+5E76) per UCV #22, and 并 (U+5E76) is also could be written as the form which the top is 八. Note that there is also no similar glyph registered under 并 (U+5E76) in any IVS collection of IVD now.



Fig. 3.1.2 Hànzìhǎi, p. 146



Fig. 3.1.3 Zhíyīnpiān, juan 1

The top of this fingering letter should be written as 八 most commonly, because the top is derived from 分 (U+5206) which the top must be 八 not 丷. On the other hand, 并 is not used as an individual fingering letter in Jianzi Musical Notation. However, the meaning of 并 (U+5E76) is “to combine”, and the meaning of this fingering letter is “to separate”, which are antonyms. We don’t have a strong comment to oppose the unification for this fingering letter and 并 (U+5E76).

6) Similar to 5), we don’t have a strong comment to oppose the unification for 囹 (&042;) and 囹冂合 (WS2021-00267:UTC-03223).

7) For 卡 (&053;), it is one of the numerals, but it is only used as the marker. This one means “11” not “10.1”, so the corresponding marker should be the eleventh marker not the tenth marker and the first sub-marker.

8) For 卜 (&056;), it is totally different from 卜 (U+535C), see 7) under Table 3.1.1. There are 13 markers on the panel of Guqin, but the left area of the thirteenth marker is often called as this marker, the most common position is about 1 cm to the left of the thirteenth marker. We treat it as “the fourteenth marker”. 卜 (&056;) is only used for the marker, and 卜 (U+535C) is used for the additional fingering letter in the big-sized “characters” structures, which are both before the core fingering letter, so they can’t be confused. For the ideographic rationale, 卜 (&056;) is derived from the right component of 外 (U+5916) which the right part of current J- and K-Source glyphs match the glyph for 卜 (&056;) more, so it must be the variant of 卜 (U+535C). We still hope to encode 卜 (&056;) separately; if other experts oppose, it is also acceptable to unify it with 卩 (U+20061) for the backup request.



Fig. 3.1.4 U+5916

8) For 夲 (&076;), it is similar to 氵 (U+6C35), but the sliding amplitude is larger. The top of this fingering is not related to 大 (U+5927) “the thumb”, and the real thumb could be used before 氵 (U+6C35), which the meaning and presenting glyph are different. This fingering is often treated as a whole one, so it is OK to encode it separately.

9) For 奫 (&081;), it is compounded by 大 (U+5927) “large”, 序 (U+5E8F) “overture” and the left part of 終 (U+7D42) “end”, that means “the end of the large overture” for the whole. The structure is stable and some

parts are not the fingering letter individually, such as 序 (U+5E8F), some parts are different from the common meaning when it is used as the fingering letter, such as 大 (U+5927). Therefore, it is better to treat it and other similar ones as the wholes to encode separately.

10) For 夼 (&122;), the glyph looks similar to 奇 (U+5947) or 竒 (U+7AD2), but the compounding rule is totally different. There are two understandings for this one, one is compounded by the outside component of the right part of 倚 (U+202E3) and 亇 (U+53B6), the other is compounded by 亐 (&017;), 丁 (U+4E01) and 亇 (U+53B6). It is not suitable to unify it with 竒 (U+7AD2), but it is OK to add the `kSpoofingVariant` property values for both of them in future if needed.

3.2. Excluded fingering letters

In the fingering letter lists of the ancient and modern books, some ones are excluded in our lists. There are three reasons: one fingering letter should be unified but not identified with one encoded character or one proposed character; one fingering letter is compounded by different other fingering letters, which is not suitable to encode separately; there is no more actual use cases in the running Jianzi musical scores for Guqin.

3.2.1. Fingering letters which should be unifiable

The following two are the same anytime for meaning, reading and location of structures. When they are used as the component of other more complex fingering letter, the meanings, readings and locations of the structures are still the same. This unification is beyond current UCV used in IRG WSes, but they are only used as the Jianzi Fingering Letter not for other individual Hanzi. We think the unification is better.

Table 3.2.1 Unifiable example

勺	勻

We suggest the following rules on the unification only for the Jianzi Fingering Letters.

1) The glyphs are similar or the unifications match UCV rules;

2) The meanings, readings, and locations of the structures must be the same;

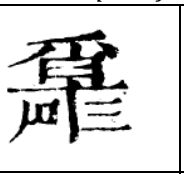
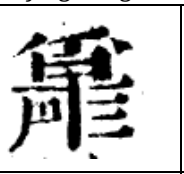
3) The unification doesn't affect the encoding of common individual Hanzi, that means the fingering letters should be disunified if the corresponding Hanzi should be disunified.

We will register the unifiable glyphs to IVD in a new specifical IVS collection when all the basic ones are encoded in UCS / Unicode. Please more details in Appendix D, E, F and G.

3.2.2. Fingering letters which are not suitable to encode separately

As Section 2.5.3.5 shows, 龘 (掐撮三声) is often listed in several fingering letter lists (we had collected more than 30 books related to this one as below), but it is not an individual fingering letter in fact, that means it is not suitable to encode this one as the individual CJKUI directly. This one is used commonly in the running musical score, so we will show it as the sequence.

Table 3.2.2.1 Example 1 for the fingering letter which is not suitable to encode separately

					
Chéngjiàntáng Qínpǔ, Book 1, juan A, folio 4	*Déyīntáng Qínpǔ*, Book 2, juan 4, folio 3	*Jiāo'ān Qínpǔ*, juan 1, folio 26	*Qínxué Cóngshū*, Book 9, folio 5	*Wǔzhīzhāi Qínpǔ*, Book 2, juan 1, folio 45	*Yījīnglú Qínxué*, juan 2, folio 2

On the other hand, there is one kind of that shows as the small-sized "characters" form in the form in the running text but shows as the big-sized "character" form only in the Jianzi fingering letters list. Table 3.2.2.2 shows this example in the Jianzi fingering letters lists of different books, and Table 3.2.2.3 shows the comparison. We think it is better to handle them by GSUB features and we have a plan to register a new feature tag for "big-sized character form of the sequence of small-sized characters form for Jianzi Musical Notation" in OFF / OpenType in future. Please see more details in Appendix G.

Table 3.2.2.2 Example 2 for the fingering letter which is not suitable to encode separately

					
Chéngjiàntáng Qínpǔ, Book 1, juan B, folio 8	*Déyīntáng Qínpǔ*, Book 2, juan 4, folio 5	*Jiāo'ān Qínpǔ*, juan 1, folio 30	*Qínxué Cóngshū*, Book 9, folio 7	*Wǔzhīzhāi Qínpǔ*, Book 2, juan 1, folio 50	*Yījīnglú Qínxué*, juan 2, folio 2

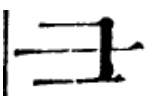
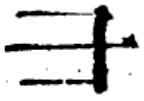
Table 3.2.2.3 Comparison between the original small-sized "characters" form in horizontal and the big-sized "character" form for Example 2

	
original small-sized double "characters" form	big-sized "character" form

3.2.3. Fingering letters which lack the actual use cases

Macao SARG request one UNC on the second stage simplified character of 雪 (U+96EA) in IRGN2538R (=L2/22-076). At the same time, UTC and Việt Nam also had the similar requests in IRGN2543 (=L2/22-042) and IRGN2509VietnamResponse (=L2/22-091), and several members and experts provided their comments. IRG decided to accept the request and only encode one disunified character as 彐 (U+2B739) from 彑 (U+5F50). In TCA feedback, TCA pointed out the long-hand form and the hand form both mean the same thing derived from the seal form of 又 (U+53C8, aka *U+38865 in WG2 N5209).

The following fingering letter is included in at least six fingering letter lists in the ancient books, which the form is unique and matches the long-hand form mentioned above, but we can't find the actual use cases which are suitable for the encoding works. It won't be treated as the fingering letter for now. If we find the actual use cases in future, it should be mapped to 彐 (U+2B739) without any doubt.

					
Chéngyītáng Qínpǔ, Book 4, juan 1, folio 13	*Jiāo'ān Qínpǔ*, juan 1, folio 36	*Wǔzhīzhāi Qínpǔ*, Book 2, juan 1, folio 61	*Zìyuǎntáng Qínpǔ*, juan 3, folio 11	*Liàohuáitáng Qínpǔ*, juan 1, folio 1	*Tiānwéngé Qínpǔ*, juan 5, folio 22

3.3. Big-sized "characters"

(This part corresponds to Section 2.3.)

The basic solution for the big-sized "characters" is to include and arranged several elements mentioned in Table 2.3 in order and add JZFJ between every two elements to make them as sequence. Note: As Section 3.2.1 shows, we will register the unifiable fingering letters as IVSes in future, so one IVS or SVS should be treated

as one element that means there is no need to add JZFJ between the fingering letter used for the basic character and the variation selector in variation sequence.

The presenting position of the fingering letters could but not must be changeable in the visual structure, but the meanings and readings have been kept matching the basic formats, so we need to put forward the changeable levels for the elements as below. The changeable glyphs must be unified with the corresponding basic one which could be interchangeable freely for the real uses, so we suggest handle them only by GSUB of OFF / OpenType not UCS / Unicode. It is not so much important for the encoding works, so we just mention the basic rules here, not show more details. This part is also useful for the input method, so the IME developers could also pay more attention on it.

Table. 3.3.0 Changeable levels of the elements in big-sized "characters"

Level	**Definition**	**Applicable Type**	**Note**
L0	JZFJ	All	no necessary representative glyph
L1	movable element	1 2 3 5	basic
L1.1	derived element from Level 1	2	
L1.5	derived element from Level 1	2	
L1.9	derived element from Level 1	2	
L2	left-hand fingering letter, marker and sub-marker	1 2 3 5	basic
L2.5	derived element from Level 2	2	
L3	consolidateable element	3	
L4	core fingering letter, string, preposed fingering letter, JZPJ, common Hanzi	1 2 3 4 5 6	basic
L4.5	derived element from Level 4	2	
L5	elements that can be only interchanged with adjacent ones	4 5	basic
L5.1	derived element from Level 5	4 5	
L5.5	derived element from Level 5	5	
L5.9	derived element from Level 5	4 5	
L6	core fingering letter that can be moved to the visual front	1	
L7	additional and core fingering letter that can be moved to the visual last together	3	

3.3.1. Type 1

(This part corresponds to Section 2.3.1.)

The basic format is `ILMLMACST`, the number ranges of different parts are shown as below.

Table 3.3.1.1 Information on Type 1

Element	**I**	**L_1**	**M_1**	**L_2**	**M_2**	**A**	**C**	**S**	**T**
Minimum	0	0	0	0	0	0	1	0	0
Maximum	1	1	3	1	3	5		6	1
Level	L1	L2	L2	L2	L2	L1	L4	L4	L4

The sequences for the examples used in Section 2.3.1 should be like the followings. There is one asterisk before the unencoded character. In the special situation mentioned in Section 2.3.1, the core fingering letter

is ibid omitted visually, so the core fingering letter should be JZFR (aka IDF) to make the sequence complete.

Table 3.3.1.2 Sequences of Type 1 examples





Example	Glyph	Length	Sequence
1-1	𠷎	7	大, JZFJ, 九, JZFJ, 勹, JZFJ, 四 [5927, *XXXa, 4E5D, *XXXa, 52F9, *XXXa, 56DB]
1-2	𡕒	13	尢, JZFJ, 夕, JZFJ, 九, JZFJ, 九, JZFJ, 氵, JZFJ, 勹, JZFJ, 三 [5C22, *XXXa, 5915, *XXXa, 4E5D, *XXXa, 4E5D, *XXXa, 6C35, *XXXa, 52F9, *XXXa, 4E09]

For the changeable glyphs of Type 1, they should follow the following rules to analyze.

S1) Mark the level tags as Table 3.3.1.1 shows without JZFJ.

S2) If there are multiple elements marked as L1 in the sequence, the level of the first element marked as L1 is kept as L1, others are changed to L4.

Specially, if there is no element marked as L2 in the sequence, and there are two elements marked as L1, the level of the first element marked as L1 is kept as L1, the other is changed to L2.

If **C** is 癶 (U+7676), 市 (U+30009), 帶 (*&116;) or 厺 (*&018;), the level of **C** is changed to L6.

If there is only one element marked as L1 in the sequence, there will be not any change in this step.

S3) There are two parts in this step to get the express orderings.

S3.1) The element marked as L1 could be expressed at the default location, or between the elements marked as L2 and L4.

S3.2) The element marked as L6 could be expressed at the default location, or the foremost of the structure.

The analyses of Examples 1-1 and 1-2 are shown as below. Note that JZFJ is omitted here in the analyses.

For Example 1-1, there is only one express ordering which is the same as the sequence ordering.

Table 3.3.1.3 Analyses of level tags of Example 1-1

	大	九	勹	四
Element	L	M	C	S
Seq. Order.	0	1	2	3
S1	L2	L2	L4	L4
S2	L2	L2	L4	L4
Exp. Order.	0	1	2	3

For Example 1-2, there are two express orderings, the first one is the same as the sequence ordering, the second one is 尢 (U+5C22, aka **I**) could also be expressed between the second 九 (U+4E5D, aka the second **M**) and 氵 (U+6C35, aka **A**).

Table 3.3.1.4 Analyses of level tags of Example 1-2

	尢	夕	九	九	氵	勹	三
Element	I	L	M	M	A	C	S
Seq. Order.	0	1	2	3	4	5	6
S1	L1	L2	L2	L2	L1	L4	L4
S2	L1	L2	L2	L2	L4	L4	L4
Exp. Order. 1	0	1	2	3	4	5	6
Exp. Order. 2	3	0	1	2	4	5	6

3.3.2. Type 2

(This part corresponds to Section 2.3.2.)

The basic format is ILMACSACST, the number ranges of different parts are shown as below.

Table 3.3.2.1 Information on Type 2

Element	**I**	**L**	**M**	**A_1**	**C_1**	**S_1**	**A_2**	**C_2**	**S_2**	**T**
Minimum	0	0	0	0	1	0	0	1	0	0
Maximum	1	1	3	1		2	1		2	1
Level	L1	L2	L2	L1	L4	L4	L1	L4	L4	L1

The sequences for the examples used in Section 2.3.2 should be like the followings. There is one asterisk before the unencoded character.

Table 3.3.2.2 Sequences of Type 2 examples

Example	**Glyph**	**Length**	**Sequence**
2-1		9	𠂉, JZFJ, 厶, JZFJ, 一, JZFJ, 勹, JZFJ, 二 [*012, *XXXa, 53B6, *XXXa, 4E00, *XXXa, 52F9, *XXXa, 4E8C]
2-2		11	大, JZFJ, 五, JZFJ, 厶, JZFJ, 六, JZFJ, 勹, JZFJ, 七 [5927, *XXXa, 4E94, *XXXa, 53B6, *XXXa, 516D, *XXXa, 52F9, *XXXa, 4E03]

For the changeable glyphs of Type 2, they should follow the following rules to analyze.

S1) Mark the level tags as Table 3.3.2.1 shows without JZFJ.

S2) If there is only one element marked as L1 in the sequence, there will be not any change in this step.

If there are multiple elements marked as L1 in the sequence, there are four parts in this step.

S2.1) If there is not element before the element marked as L1, but there is at least one element after the element marked as L1, the level tag of it is changed to L1.1.

S2.2) If there are at least one element before the element marked as L1 and after the element marked as L1, the level tag of it is changed to L1.5.

S2.3) If there is not element after the element marked as L1, but there is at least one element before the element marked as L1, the level tag of it is changed to L1.9.

S2.4) The priority to keep the level tag is L1.9>L1.1>L1.5.

S2.4.1) If there are the elements marked as L1.1 and L1.5 in the sequence at the same time, L1.1 is changed back to L1, L1.5 which is between the elements marked as L2 and L4 is changed to L4, L1.5 which is between two elements marked as L4 is changed to L2.

S2.4.2) If there are the elements marked as L1.1 and L1.9 in the sequence at the same time, L1.1 is changed to L2, L1.9 is changed back to L1.

S2.4.3) If there are the elements marked as L1.5 and L1.9 in the sequence at the same time, L1.9 is changed back to L1, L1.5 which is between the elements marked as L2 and L4 is changed to L4, L1.5 which is between two elements marked as L4 is changed to L2.

S2.4.4) If there are the elements marked as L1.1, L1.5 and L1.9 in the sequence at the same time, L1.1 and L1.5 which is between two elements marked as L4 are both changed to L2, L1.5 which is between the elements marked as L2 and L4 is changed to L4, L1.9 is changed back to L1.

S3) If there are multiple consecutive elements marked as L2 or L4 in the sequence, there are two parts in this step; if not, there will be not any change.

S3.1) If there are multiple consecutive elements marked as L2 in the sequence, the fist L2 is kept as L2, but the residual L2 are all changed to L2.5 at the same time.

S3.2) If there are multiple consecutive elements marked as L4 in the sequence, the fist L4 is kept as L4, but the residual L4 are all changed to L4.5 at the same time.

S4) There are three parts in this step to get the express orderings.
S4.1) If there is not element before the element marked as L1, and there is at least one element after the element marked as L1, that means the foremost location of the visual structure, and the element marked as L1 could be expressed at the default location, or between the elements marked as L2 and L4.
S4.2) If there are at least one element before the element marked as L1 and after the element marked as L1, that means between two other elements, and the element marked as L1 could be expressed at the default location, or before the first element marked as L2.
S4.3) If there is not element after the element marked as L1, and there is at least one element before the element marked as L1, that means the last location of the visual structure, and the element marked as L1 could be expressed at the default location; or we could keep the ordering of the elements marked as L2 and L2.5 and make them in the foremost location of the visual structure, keep the ordering of the elements marked as L4 and L4.5 and make them in the end location of the visual structure, that means the element marked as L1 is in the middle location; or we could keep the ordering of multiple elements marked as L2.5 and make them before the element marked as L2, keep the ordering of multiple elements marked as L4.5 and make them before the element marked as L4.5 at the same time.

These two examples have not any changeable glyph, so the analyses of them are omitted here.

3.3.3. Type 3

(This part corresponds to Section 2.3.3.)

The basic format is `IACILMACSILMACST`, the number ranges of different parts are shown as below.

Table 3.3.3.1 Information on Type 3

Element	**I_1**	**A_1**	**C_1**	**I_2**	**L_1**	**M_1**	**A_2**	**C_2**
Minimum	0	0	1	0	0	0	0	1
Maximum	1	1		1	1	3	2	
Level	L1	L1	L4	L1	L2	L2	L1	L4
Element	**S_1**	**I_3**	**L_2**	**M_2**	**A_3**	**C_3**	**S_2**	**T**
Minimum	0	0	0	0	0	1	0	0
Maximum	1	1	1	3	1		1	1
Level	L4	L1	L2	L2	L1	L4	L4	L4

The sequences for the examples used in Section 2.3.3 should be like the followings. There is one asterisk before the unencoded character. In the special situation mentioned in Section 2.3.3, the second or third core fingering letters is ibid omitted visually, so the omitted core fingering letter should be JZFR (aka IDF) to make the sequence complete.

Table 3.3.3.2 Sequences of Type 3 examples

Example	**Glyph**	**Length**	**Sequence**
3-1		15	早, JZFJ, 大, JZFJ, 九, JZFJ, JZFR, JZFJ, 四, JZFJ, 廿, JZFJ, JZFR, JZFJ, 七 [65E9, *XXXa, 5927, *XXXa, 4E5D, *XXXa, *XXXc, *XXXa, 56DB, *XXXa, 5344, *XXXa, *XXXc, *XXXa, 4E03]
3-2		15	早, JZFJ, 夕, JZFJ, 十, JZFJ, 勹, JZFJ, 五, JZFJ, 廿, JZFJ, 乚, JZFJ, 七 [65E9, *XXXa, 5915, *XXXa, 5341, *XXXa, 52F9, *XXXa, 4E94, *XXXa, 5344, *XXXa, 4E5A, *XXXa, 4E03]

For the changeable glyphs of Type 3, they should follow the following rules to analyze.

S1) Mark the level tags as Table 3.3.3.1 shows without JZFJ.
S2) There are two parts in this step.
S2.1) If there are the same characters (not elements) marked as L1 or L2 in the sequence at the same time, they are changed to L3.
S2.2) If **C** is 𠘨 (U+5405) and the adjacent previous fingering letter is 双 (U+53CC), the level tags of these two elements are both changed to L7.
S3) There are two parts to handle multiple elements marked as L1 in this step.
S3.1) The element marked as L1 which is between two elements marked as L4 is changed to L2.
S3.2) For the residual elements marked as L1, the level tag of the first element marked as L1 is kept as L1, others are changed to L4.
S4) There are six parts in this step to get the express orderings.
S4.1) If there is not element before the element marked as L1, and there is at least one element after the element marked as L1, that means the foremost location of the visual structure, and the element marked as L1 could be expressed at the default location, or between the closely following elements marked as L2 and L4, or between the elements marked as L4 and L2. For the last one, when the element marked as L1 is expressed after its default location, the vacant location with the same element mark must copy this element marked as L1.
S4.2) If there are at least one element before the element marked as L1 and after the element marked as L1, that means between two other elements, and the element marked as L1 could be expressed at the default location, or the foremost location of the visual structure.
S4.3) The element marked as L2 could be expressed at the default location, or before the default location.
If the level tag of the foremost element is L1, the element marked as L2 could also be expressed between the elements marked as L1 and L4; if the level tag of the foremost element is L4, the element marked as L2 could also be expressed before the first element marked as L4.
S4.4) The element marked as L3 could be expressed at the default location, or before the default location. The multiple elements marked as L3 should be merged as the same one when it is expressed before the default location. If the multiple elements marked as L3 need to be expressed before the default location, they must be changed at the same time commonly.
S4.5) The elements marked as L1, L2 and L3 could be changed at the same time, but the default orderings must be kept among multiple changeable levels.
S4.6) The element marked as L7 could be expressed at the default location, or the end location of the visual structure.

The analyses of Examples 3-1 and 3-2 are shown as below. Note that JZFJ is omitted here in the analyses.
For these two examples, there are both four express orderings, the first one is the same as the sequence ordering, the second one is 大 (U+5927) / 夕 (U+5915, both **L**) and 九 (U+4E5D) / 十 (U+5341, both **M**) could also be expressed in the foremost of the structure together, the third one is 卄 (U+5344, aka **A**) could also be expressed in the foremost of the structure, the fourth one is 大 (U+5927) / 夕 (U+5915, both **L**), 九 (U+4E5D) / 十 (U+5341, both **M**) and 卄 (U+5344, aka **A**) could also be expressed in the foremost of the structure together.

Table 3.3.3.3 Analyses of level tags of Type 3 examples

Ex. 3-1	早	大	九	JZFR	四	卄	JZFR	七
Ex. 3-2	早	夕	十	勹	五	卄	乚	七
Element	C	L	M	C	S	A	C	S
Seq. Order.	0	1	2	3	4	5	6	7

S1	L4	L2	L2	L4	L4	L1	L4	L4
S2	L4	L2	L2	L4	L4	L1	L4	L4
S3.1	L4	L2	L2	L4	L4	L2	L4	L4
S3.2	L4	L2	L2	L4	L4	L2	L4	L4
Exp. Order. 1	0	1	2	3	4	5	6	7
Exp. Order. 2	2	0	1	3	4	5	6	7
Exp. Order. 3	1	2	3	4	5	0	6	7
Exp. Order. 4	3	0	1	4	5	2	6	7

3.3.4. Type 4

(This part corresponds to Section 2.3.4.)

The basic format is CO, the number ranges of different parts are shown as below.

Table 3.3.4.1 Information on Type 4

Element	C	O
Minimum	1	2
Maximum		
Level	L4	L5

The sequences for the examples used in Section 2.3.4 should be like the followings. There is one asterisk before the unencoded character.

Table 3.3.4.2 Sequences of Type 4 examples

Example	**Glyph**	**Length**	**Sequence**
4-1		5	早, JZFJ, 同, JZFJ, 上 [65E9, *XXXa, 540C, *XXXa, 4E0A]
4-2		5	戈, JZFJ, 同, JZFJ, 上 [6208, *XXXa, 540C, *XXXa, 4E0A]

For the changeable glyphs of Type 4, they should follow the following rules to analyze.

S1) Mark the level tags as Table 3.3.4.1 shows without JZFJ.

S2) There are four parts in this step.

S2.1) For one element marked as L5, if the level tag of another element before it isn't L5, and the level tag of that element after it is L5, the level tag of it is changed to L5.1.

S2.2) For one element marked as L5, if the level tag of another element before it is L5, and the level tag of that element after it isn't L5, the level tag of it is changed to L5.9.

S2.3) For one element marked as L5, if the level tags of other elements before and after it are both L5, that means it is a bad format.

S2.4) For one element marked as L5, if the level tags of other elements before and after it aren't both L5, that means it is also a bad format.

S3) There is only one part in this step to get the express orderings. The element marked as L5.9 could be expressed at the default location, or before the element marked as L5.1.

In the common uses, the latter is the most common, that means it is common to show 同 (U+540C) is at the right bottom, and 上 (U+4E0A) is at the left bottom, and we treat this one as the default one.

The analyses of Examples 4-1 and 4-2 are shown as below. Note that JZFJ is omitted here in the analyses.

For these two examples, they could be expressed as the default express ordering, or the locations of two **O**s could be exchanged.

Table 3.3.4.3 Analyses of level tags of Type 4 examples

Ex. 4-1	早	同	上
Ex. 4-2	癶	同	上
Element	C	O	O
Seq. Order.	0	1	2
S1	L4	L5	L5
S2	L4	L5.1	L5.9
Exp. Order. 1	0	2	1
Exp. Order. 2	0	1	2

3.3.5. Type 5

(This part corresponds to Section 2.3.5.)

The basic format is `ILMACNT`, the number ranges of different parts are shown as below.

Table 3.3.5.1 Information on Type 5

Element	**I**	**L**	**M**	**A**	**C**	**N**	**T**
Minimum	0	0	0	0	1	1	1
Maximum	1	1	3	2		2	
Level	L1	L2	L2	L1	L4	L5	L5

The sequences for the examples used in Section 2.3.5 should be like the followings. There is one asterisk before the unencoded character.

Table 3.3.5.2 Sequences of Type 5 examples

Example	**Glyph**	**Length**	**Sequence**
5-1		11	大, JZFJ, 三, JZFJ, 半, JZFJ, 巛, JZFJ, 三, JZFJ, 尸 [5927, *XXXa, 4E09, *XXXa, 534A, *XXXa, 5DDB, *XXXa, 4E09, *XXXa, 200DC]
5-2-6		7	JZFR, JZFJ, 十, JZFJ, 五, JZFJ, 尸 [*XXXc, *XXXa, 5341, *XXXa, 4E94, *XXXa, 200DC]
5-3-1		7	乎, JZFJ, 早, JZFJ, 三, JZFJ, 尸 [2B735, *XXXa, 65E9, *XXXa, 4E09, *XXXa, 200DC]

For the changeable glyphs of Type 5, they should follow the following rules to analyze.

S1) Mark the level tags as Table 3.3.5.1 shows without JZFJ.

S2) If there are multiple elements marked as L1 in the sequence at the same time, the level tag of the first element marked as L1 is kept as L1, the level tags of others are changed to L4.

If there is only one element marked as L1 in the sequence, there will be not any change in this step.

S3) There are four parts in this step.

S3.1) If **C** is not 早 (U+65E9), 十 (U+2C09B), 章 (U+2304C), 卓 (&020;), 斈 (&097;), 𠬝 (&067;), 𠬞 (&066;), 𠬟 (&116;) and so on, the level tag of the elements marked as L5 are all changed to L4; if not, analyze as below.

S3.2) For one element marked as L5, if the level tag of other element before it isn't L5, and the level tag of that element after it is L5, the level tag of it is changed to L5.1.

S3.3) For one element marked as L5, if the level tag of other element before it is L5, and the level tag of that element after it isn't L5, the level tag of it is changed to L5.9.

S3.4) For one element marked as L5, if the level tag of other elements before and after it are both L5, the level tag of it is changed to L5.5.

S3.5) For one element marked as L5, if the level tag of other elements before and after it aren't both L5, the

level tag of it is changed to L4.
S4) There are two parts in this step to get the express orderings.
S4.1) The element marked as L1 could be expressed at the default location, or between the elements marked as L2 and L4.
S4.2) The element marked as L5.9 could be expressed at the default location, or before the element marked as L5.1.
In the common uses, the latter is the most common, and we treat this one as the default one.

The analyses of Examples 5-1, 5-2-6 and 5-3-1 are shown as below. Note that JZFJ is omitted here in the analyses.
For Example 5-1, there is only one express ordering which is the same as the sequence ordering.

Table 3.3.5.3 Analyses of level tags of Example 5-1

	大	三	半	巛	三	尸
Element	L	M	M	C	N	T
Seq. Order.	0	1	2	3	4	5
S1	L2	L2	L2	L4	L5	L5
S2	L2	L2	L2	L4	L5	L5
S3	L2	L2	L2	L4	L4	L4
Exp. Order. 1	0	1	2	3	4	5

For Example 5-2-6, there is also only one express ordering which is the same as the sequence ordering.

Table 3.3.5.4 Analyses of level tags of Example 5-2-6

	JZFR	十	五	尸
Element	C	N	N	N
Seq. Order.	0	1	2	3
S1	L4	L5	L5	L5
S2	L4	L5	L5	L5
S3	L4	L4	L4	L4
Exp. Order. 1	0	1	2	3

For Example 5-3-1, it could be expressed as the default express ordering, or the locations of two **N**s could be exchanged.

Table 3.3.5.5 Analyses of level tags of Example 5-3-1

	彡	早	三	尸
Element	A	C	N	N
Seq. Order.	0	1	2	3
S1	L1	L4	L5	L5
S2	L1	L4	L5	L5
S3	L1	L4	L5.1	L5.9
Exp. Order. 1	0	1	3	2
Exp. Order. 2	0	1	2	3

Similar to the last paragraph of Section 2.3.5 shows, the changeable glyph rule of Type 5 is also different from Type 1.

3.3.6. Type 6

(This part corresponds to Section 2.3.6.)

The basic format is `PH`, the number ranges of different parts are shown as below. Note that the format control

in this type should be JZPJ

Table 3.3.5.6 Information on Type 6

Element	**P**	**H**
Minimum	1	1
Maximum		
Level	L4	L4

The sequences for the examples used in Section 2.3.6 should be like the followings. There is one asterisk before the unencoded character.

Table 3.3.5.6 Sequences of Type 6 examples

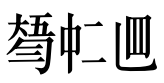
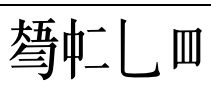
Example	**Glyph**	**Length**	**Sequence**
6-1		3	从, JZPJ, 關 [4ECE, *XXXb, 95DC]
6-2		3	厶, JZPJ, 關 [20AD4, *XXXb, 95DC]

There is no changeable glyph for Type 6, because the visual structure of this type is very stable in any time. We could mark the level tags as Table 3.3.5.6 shows, but this behavior is useless for most of the time.

3.3.7. Additional instruction

In the possible running text, the actual meanings of the following streams are different, even though the basic elements without the format controls are totally the same.

Table 3.3.7.1 Comparison on three cases for the presenting glyphs and streams

1	
	5927, *XXXa, 4E94, *XXXa, 52F9, *XXXa, 4E09, 4E2D, *XXXa, 4E8C, *XXXa, 4E5A, *XXXa, 56DB
2	
	5927, *XXXa, 4E94, *XXXa, 52F9, *XXXa, 4E09, 4E2D, *XXXa, 4E8C, 4E5A, *XXXa, 56DB
3	
	5927, *XXXa, 4E94, *XXXa, 52F9, *XXXa, 4E09, 4E2D, *XXXa, 4E8C, 4E5A, *XXXc, *XXXa, 56DB

For Case 1, there are two movements, and the left-hand movement and right-hand movement are different; for Case 2, there are three movements, the right-hand movement of the second movement is inherited from the first movement, and the left-hand movement of the third movement is inherited from the second movement; for Case 3, there are four movements, the right-hand movement of the second movement is inherited from the first movement like Case 2, but the core fingering of the third movement is different from the second movement, and the string of the fourth movement is different from the third movement.

Based on the above analysis, Cases 2 & 3 could be analyzed as the following integral forms on Table 3.3.7.2, but the musicians and other users like the concise forms mentioned on Table 3.3.7.1 during the running Jianzi scores more.

Table 3.3.7.2 Integral forms for Cases 2 & 3 on Table 3.3.7.1

SN	Concise form	Integral form
2	𰵀𰻞𠙵	𰵀𰵀𰻞𠙵
3	𰵀𰻞乚皿	𰵀𰵀𰻞𰻞𠙵

We can easily know the format controls are also important to distinguish the different meanings.

3.4. Small-sized "characters"

(This part corresponds to Section 2.4.)

There are seven kinds of layout forms in the horizontal layout, but the corresponding layout forms in the vertical layout are unique. The structure for all the small-sized "characters" must match the visual ordering of the sequence, so there are no changeable glyph rules for it. In one sequence of the small-sized "characters", there must be one JZSF (aka ISF) which follows each element closely, and the final one of the sequence must be ZWSP to end the sequence.

Similar to the big-sized "characters", one IVS or SVS ("S" here means "sequence" not "selector") should be treated as one element in the sequence.

3.4.1. Single-character form

(This part corresponds to Section 2.4.2.1 & 2.4.1.)

Most of the fingering letters which are suitable to use for the small-sized "characters" are rendered as this form when they are used in the sequence for the small-sized "characters", and others will be showed in Section 3.4.2.

The basic format is one fingering letter with one following JZSF, and end with one ZWSP.

`element,JZSF,ZWSP`

The sequences for the examples used in Section 2.4.2.1 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.1 Sequences of single-character form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
1-1	艮	艮	3	艮, JZSF, ZWSP [826E, *XXXd, 200B]
	旨	旨	3	旨, JZSF, ZWSP [2D94D, *XXXd, 200B]

3.4.2. Sinking single-character form

(This part corresponds to Section 2.4.2.2 & 2.4.1.)

The basic format is the same as single-character form, but the fingering letters which are suitable for this form are different. The following table shows all the fingering letters like this.

Table 3.4.2.1 List of the fingering letters which are suitable for sinking single-character form

UCS / SN	Glyph	Fingering Name
U+4ECA	今	吟
U+53F6	叶	叶
U+5408	合	合
U+65B9	方	放 方

UCS / SN	Glyph	Fingering Name
U+72AD	犭	猱
U+22208	庴	应合 應合 応合
U+25421	斫	碎吟
U+2C5C3	紜	细吟 細吟
U+2CF3D	亍	吟
&040;	冏	同声 同聲
&070;	囝	打圆 打圓 打円
&082;	对	对按 對按 対按
&123;	紛	细猱 細猱
&131;	荒	荡吟 蕩吟
&132;	荖	荡猱 蕩猱
&134;	迂	游吟 遊吟

The sequences for the examples used in Section 2.4.2.1 should be like the following. There is one asterisk before the unencoded character and undefined VS.

Table 3.4.2.2 Sequences of sinking single-character form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
1-2			4	亍, VSnn, JZSF, ZWSP [2CF3D, *E01XX, *XXXd, 200B]

3.4.3. Double-characters form

(This part corresponds to Section 2.4.2.3 & 2.4.1.)

If the last element in the sequence is not in Table 3.4.2.1, the render effect belongs to this.

The basic format is one fingering letter with one following JZSF, one fingering letter with one following JZSF, and end with one ZWSP.

`element,JZSF,element,JZSF,ZWSP`

The sequences for the examples used in Section 2.4.2.3 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.3 Sequences of double-characters form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
2-1			5	上, JZSF, 丰, JZSF, ZWSP [4E0A, *XXXd, 30001, *XXXd, 200B]

3.4.4. Sinking double-characters form

(This part corresponds to Section 2.4.2.4 & 2.4.1.)

If the last element in the sequence is in Table 3.4.2.1, the render effect belongs to this.

The basic format is the same as double-characters form.

The sequences for the examples used in Section 2.4.2.4 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.4 Sequences of sinking double-characters form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
2-2			6	立, JZSF, 亍, VSnn, JZSF, ZWSP [7ACB, *XXXd, 2CF3D, *E01XX, *XXXd, 200B]

3.4.5. Triple-characters form

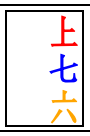
(This part corresponds to Section 2.4.2.5 & 2.4.1.)

There is not the sinking triple-characters form, even though the last element in the sequence is in Table 3.4.2.1. The basic format is one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, and end with one ZWSP.

`element,JZSF,element,JZSF,element,JZSF,ZWSP`

The sequences for the examples used in Section 2.4.2.5 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.5 Sequences of triple-characters form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
3			6	上, JZSF, 七, JZSF, 六, JZSF, ZWSP [4E0A, *XXXd, 4E03, *XXXd, 516D, *XXXd, 200B]

3.4.6. Quadruple-characters form

(This part corresponds to Section 2.4.2.6 & 2.4.1.)

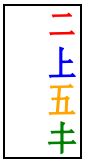
There is also not the sinking quadruple-characters form, even though the last element in the sequence is in Table 3.4.2.1.

The basic format is one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, and end with one ZWSP.

`element,JZSF,element,JZSF,element,JZSF,element,JZSF,ZWSP`

The sequences for the examples used in Section 2.4.2.6 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.6 Sequences of quadruple-characters form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
4			9	二, JZSF, 上, JZSF, 五, JZSF, 丰, JZSF, ZWSP [4E8C, *XXXd, 4E0A, *XXXd, 4E94, *XXXd, 30001, *XXXd, 200B]

3.4.7. Quintuple-characters form

(This part corresponds to Section 2.4.2.7 & 2.4.1.)

There is still not the sinking quintuple-characters form, even though the last element in the sequence is in Table 3.4.2.1.

The basic format is one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, one fingering letter with one following JZSF, and end with one ZWSP.

`element,JZSF,element,JZSF,element,JZSF,element,JZSF,element,JZSF,ZWSP`

The sequences for the examples used in Section 2.4.2.7 should be like the following. There is one asterisk before the unencoded character.

Table 3.4.7 Sequences of quintuple-characters form example

Example	Hor. Glyph	Ver. Glyph	Length	Sequence
5			11	車, JZSF, 尙, JZSF, 下, JZSF, 十, JZSF, 八, JZSF, ZWSP [8ECA, *XXXd, 5C19, *XXXd, 4E0B, *XXXd, 5341, *XXXd, 516B, *XXXd, 200B]

3.5. Format controls clarification

In WG2 N5041, we once proposed 6 cluster controls which should be used in front of the one sequence, which is similar to the method used in Mr. Chen Changlin's (陈长林) system in some parts as Fig. 3.5.1 shows, who is the famous master on Guqin and computer, but we find that method will make us encode more and more cluster controls during the encoding works with the gradual deepening of the further research, that means we must change our thinking.

Notation. As for the character like " 芍 ", it should be notation character " 勺 ", where " 艹 " is the clipped form of character " 散 " (San), indicating no Hui is to be touched by the left hand, while " 勺 " means pulling the first string inward with the middle finger of the right hand. The basical type of Main Character is " 勉 ". Here

" 左 " indicates the fingers of the left hand;
" 山 " indicates the Hui position;
" ○ " indicates the plucking movement of the right hand;
" 玄 " indicates the ordinary number of the string.

For example:

" 勾 ": "左"——" 大 " (thumb)
"山"——" 九 " (9th Hui)
"○"——" 勹 " (Gou: pulling a string inward with the middle finger of the right hand)
" 玄 "——" 五 " (5th string)

" 毗 ": " 左 "——" 夕 " (ring finger)
" 山 "——" 𠂉 " (7.6th Hui)
" ○ "——" 乚 " (Tiao: pulling a string outward with forefinger of the right hand)
" 玄 "——" 七 " (7th string)

There are some rules for simplifying the Main Character. If there is no indication of "左", " 山 " or " ○ ", then players should continue to use what is indicated in the preceeding part of the notation. For example: " 勾𠂉 五 " means the same as " 勾𠂉𠂉 ".

Fig. 3.5.1 Chén Chánglín Qínxué Wénjí, p. 354

The basic type mark in the red oval is like JZCC01 in WG2 N5041, and the sequence compositions are similar. In this document, the sequence of 勾 (大指九徽勾五弦) is <大JZFJ九JZFJ勹JZFJ五>, and the sequence of 毗 (名指七徽六分挑七弦) is <夕JZFJ七JZFJ六JZFJ乚JZFJ七>.

In Section 2 of WG2 N5074, the author from China National Database of Characters Program (aka Chinese Characters Repertoire Program) proposed another method similar to IDS but only used for the description by XML. In Section 0.3 of this proposal or Section 1.2 of WG2 N5041, we have shown some similar method which are also not suitable for the digital plain texts supported by UCS/Unicode and OFF/OpenType together. The structures and elements of Jianzi Musical Notation are both derived from Hanzi. In the ideographic

structure of Hanzi, we can't confirm the relative location relationship between two given components. Fig. 3.5.2 shows one example that shows two given components are 日 (U+65E5) and 免 (U+514D) and the ordering is also determined, but it is hard to confirm the final structure is 晚 (U+665A, left-to-right) or 冕 (U+2F8D3, up-to-down). Unihan Database shows the `kCangjie` property values for 晚 (U+665A) and 冕 (U+5195) are both ANAU, but it is used for the internal codes firstly not only the input method codes in Zerone OS (零壹) at that time that means one "sequence" of bytes and its corresponding external code corresponds and only corresponds one character. Therefore, the internal code for 晚 is 0xE0EEE0F5A0 (5 bytes) which the corresponding input method code is anau (日弓日山), and the internal code for 冕 is 0xFAE0EEE0F5A0 (6 bytes) which the corresponding input method code is zanau (重日弓日山). 0xFA here doesn't mean the up-to-down ideographic structure, but just means to eliminate duplicates. Now, Cangjie code hasn't been no longer used as the internal code of Hanzi, so the duplicate sequences are acceptable for the input method commonly.

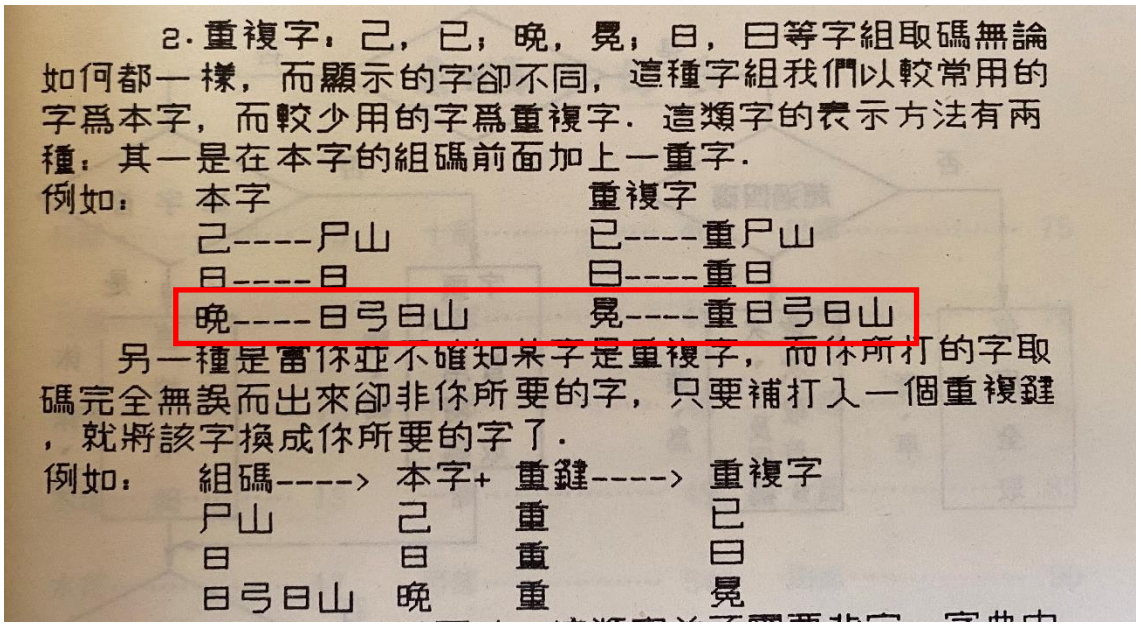

2.重複字：己，已；晚，冕；日，曰等字組取碼無論
如何都一樣，而顯示的字卻不同，這種字組我們以較常用的
字爲本字，而較少用的字爲重複字．這類字的表示方法有兩
種：其一是在本字的組碼前面加上一重字．
例如：　本字　　重複字
己----尸山　　已----重尸山
日----日　　曰----重日
晚----日弓日山　　冕----重日弓日山
另一種是當你並不確知某字是重複字，而你所打的字取
碼完全無誤而出來卻非你所要的字，只要補打入一個重複鍵
，就將該字換成你所要的字了．
例如：　組碼----> 本字+ 重鍵----> 重複字
尸山　己　重　已
日　日　重　曰
日弓日山　晚　重　冕

Fig. 3.5.2 Cāngjié Zhōngwén Zìxùnmǎ, Foreword (no page number)

However, the relative location relationship between two given Jianzi elements is clear and stable. As Table 3.5.1 shows, when the visible element 三 (U+4E09) follows the visible element 勹 (U+52F9), the structure of the result must be ⿲勹三 (匀), so other structures will not exist like ⿰勹三, ⿱勹三, ⿳勹三 and so on. As Table 3.5.2 shows, when the visible element 三 (U+4E09) follows the visible element 大 (U+5927), the structure of the result must be ⿲大三 (𡈼), so other structures will not exist like ⿰大三, ⿱大三, ⿰大三, ⿱大三, ⿳大三 and so on.

Table 3.5.1 Example 1

勹	三	→	匀
0	1		result

Table 3.5.2 Example 2

大	三	→	𡈼
0	1		result

Based on the analyses of the above two examples, the relative location relationship between two given Jianzi elements depends on the former one, so as Table 3.5.3 shows, when the visible element 勹 (U+52F9) follows the visible element 大 (U+5927), and the visible element 三 (U+4E09) follows the visible element 勹

(U+52F9), the structure must be ⿰大⿱勹三, which other structures will not exist. It means the method proposed in Section 2 of WG2 N5074 is cumbersome and meaningless.

Table 3.5.3 Example 3

大	勹	三	→	旬
0	1	2		result

Still for two examples mentioned in Fig. 3.5.1, there are both unique possibility of the sequence to handle one big-sized “characters” in this document and WG2 N5041, but there are six possibilities for Example 4 and thirteen possibilities for Example 5 in WG2 N5074, that means we need to make more than one sequence as equivalent for one big-sized “character” in future, especially used for website and database, if we use the encoding model proposed in WG2 N5074. The possibilities will be more and more, when the structure is more and more complex or there are more and more elements, that means there will be a huge amount of works waiting for UTC under this encoding model, because there is no reason to define more than 200 million sequences for the big-sized “characters” in one technical document to prevent the visual duplicates with different sequences. Note that the first one possibilities of WG2 N5074 under two examples are the most recommended ones, and the last two possibilities under Example 4 and the last six possibilities under Example 6 are not mentioned in WG2 N5074, but ⿲ (U+2FFD) and other new IDCs has been encoded since Unicode, 15.1, and we have no right to prevent the end users from using the new IDCs in any IDS.

Table 3.5.4 Comparison among this document, WG2 N4041 and N5074

Ex.	Glyph	Doc.	Possibility	Sequence	Length
4	勩	this	1	大九勹五	7
		N5041	1	大九勹五	5
		N5074	6	⿰大九⿱勹五	7
				⿱⿰大九勹五	7
				⿰大⿱勹五九	7
				⿱⿰大勹五九	7
				⿱九⿱勹五大	7
				⿱⿰九勹五大	7
5	鼕	this	1	夕七六乚七	9
		N5041	1	夕七六乚七	7
		N5074	13	⿰夕七六⿺乚七	8
				⿰⿰夕七六乚七	8
				⿰夕⿰七六⿺乚七	9
				⿱⿰夕六⿺乚七七	9
				⿱⿰⿰夕六乚七七	9
				⿱夕⿺乚七⿰七六	9
				⿱⿰夕乚七⿰七六	9
				⿱七六⿺乚七夕	8
				⿱⿰七六乚七夕	8
				⿱七六⿺乚七夕	9
				⿱七⿰六⿺乚七夕	9
				⿱⿰七六乚七夕	9
				⿱⿰七⿰六乚七夕	9

On the other hand, IDCs are used as the visible characters not the format controls. Eiso once discussed this issue with Mr. Tang Yingmin and Mr. Chen Zhuang after WG2 #68. Mr. Tang had some comments to encode

the invisible description characters only for Jianzi Musical Notation, that means there will be at least eight possible Jianzi Description Characters (JDC) needed to encode. Please see Table 3.5.5, and other five of them mentioned in WG2 N5074 could be excluded.

Table 3.5.5 Possible specialized JDCs and the corresponding IDCs after WG2 N5074

JDC								
IDC								

If the possible new JDCs are not encoded for WG2 N5074, it will need a joiner used in IDSes to distinguish the current common usages for IDS and the usages for the Jianzi Musical Notation, that means the lengths of the sequences will be longer and longer.

The following table shows the advantages and disadvantages of four schemes, and we can easily know the best one is in this document.

Table 3.5.6 Simple comparison of advantages and disadvantages of four schemes

	Format Control	**Sequence Length**	**Sequence Possibility**	**Score**
This	less	not too long	least	A
N5041	most	shortest	least	B
N5074_R1	more	not too long	most	D
N5074_R2	least	longest	most	C

For the small-sized “characters”, the structures match the orderings of the sequences absolutely, so the orderings of the sequences are enough to support the visible structure.

In Section 1.5 of WG2 N5074, the author said the small-sized “characters” issue is only for layout format (we guess he means the issue for the typesetting), but we have shown the details in the above parts to clarify why the format controls for the small-sized “characters” are needed, and it must not be the issue only for typesetting. The similar thinking and strategy also occurred in the Khitan Small Script handling case.

As Prof. Wu Yingzhe (吴英喆) and Mr. Bai Shuangcheng (白双成)’s paper shows as below, they tried to use the plug-in software supported by Menksoft () to process the structures of the phonogram clusters of Khitan Small Script in Microsoft Office Word in 2004. Other experts also showed the similar solution in the Khitan ad-hoc encoding meeting in 2016, but we had decided to use one format control (KSSF, U+16FE4) to handle ten kinds of phonogram clusters.

5．处理不同结构字的功能：契丹小字合成字的书写规则一般为从左到右，二二下推，如果是 3、5、7 个原字组成的小字，其最后一个原字居于中间。我们把这样的常用结构设为默认，即原字与原字间不写任何符号或空格，最后按回车键，屏幕上自动显示其常用组合形式。根据后来出土的资料，我们发现契丹小字的书写规则也有特殊情况的。即以 2、3、4、5、6、7 个原字组成的小字也有首一原字居于中间的。契丹小字文字处理软件对这种特殊结构字的处理方法，采取了最后一个原字前写逗号的方法，满足特殊结构词的输入目的。

Fig. 3.5.3 Guānyú Kāifā “Qìdān Xiǎozì Shùzìhuà Píngtái” de Ruògān Wèntí, Section 2.5

To sum up, the encoding model for the big-sized “characters” mentioned in this document is a better one during these four schemes. The comment for the small-sized “characters” mentioned as Section 1.5 of WG2 N5074 is misleading, that means there is valueless to pay more attention on it.

3.6. Ruby annotation “characters”

(This part corresponds to Section 2.5.)

Unicode defines a method to show the ruby annotation supported by three format controls, which are IAA (U+FFF9), IAS (U+FFFA) and IAT (U+FFFB).

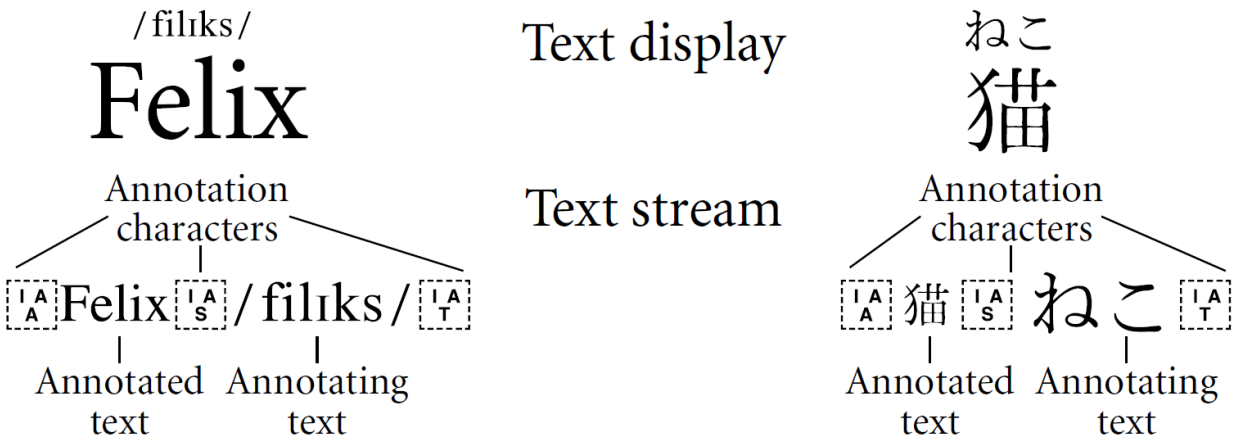


Fig. 3.6 Annotation characters

[Unicode Standard, version 15.0, p. 943, Fig. 23-4]

As Fig. 3.6 shows, IAA should be before the ruby base, IAS should be between the ruby base and the ruby text, and IAT should be after the ruby text. In the digital Jianzi musical score, we suggest what is between IAA and IAS only includes one Jianzi musical cluster not more, and if the total length in horizontal layout or the total height in vertical layout of the glyphs of the ruby text is greater than the one of the glyphs of the ruby base, there is no need to compress to match the ruby base, which is different from the common CJKV digital texts. When an end user chooses this method and the platform and software have supported these three format controls correctly, the text stream of the red rectangle in Fig. 2.5.2 should be shown as Table 3.6.1, and the one of the green rectangle in Fig. 2.5.2 should be shown as Table 3.6.2

Table 3.6.1 Text stream of red rectangle in Fig. 2.5.2

IAA	大	JZFJ	七	JZFJ	九	JZFJ	勹
0	1	2	3	4	5	6	7
JZFJ	六	IAS	氣	車	絡	IAT	
8	9	10	11	12	13	14	

Table 3.6.2 Text stream of green rectangle in Fig. 2.5.2

IAA	尚	JZSF	下	JZSF	七	JZSF	七
0	1	2	3	4	5	6	7
JZSF	ZWNJ	IAS	此	声	要	巫	IDSP
8	9	10	11	12	13	14	15
脆	滑	仙	音	自	得	IAT	
16	17	18	19	20	21	22	

W3C also defines other method to process the ruby annotation only in HTML not in the plain text. Please see the details on *Ruby Annotation W3C Recommendation 31* and the related details of CSS on *CSS Ruby Annotation Layout Module Level 1 W3C Working Draft*. If CSS supports ruby annotation features well in future, the similar method like HTML could also be used in XML and other markup languages well.

There are three forms which could be used in HTML, that are simple ruby markup form, simple ruby markup form with parentheses and complex ruby markup form. Please see the comparison as below.

Table 3.6.3 Comparison between Unicode and HTML

Unicode	IAA	IAS	IAT
simple	<ruby><rb>	</rb><rt>	</rt></ruby>
simple with parentheses	<ruby><rb>	</rb><rp>(</rp><rt>	</rt><rp>)</rp></ruby>
complex	<ruby><rbc><rb>	</rb></rbc><rtc><rt>	</rt></rtc></ruby>

If the end user only needs to show the ruby annotation of Jianzi musical score on HTML, the above table will be useful, and the simple ruby markup form is enough for the current usage.

On the other hand, we still think the current rendering effect in HTML is not the best one for Jianzi musical scores conventions. Maybe we will submit other proposal to request W3C to support the best effect well in future, but it is not the duty at this stage in this document.

3.7. Punctuation-like symbols

(This part corresponds to Section 2.6.)

Section 2.6 has shown the mapping characters for the punctuation-like symbols clearly, and we think there will not be objection on them, but there are other things which are needed to do in future.

3.7.1. Adding annotations for the characters

For the common end users, Jianzi Musical Notation has many differences with common Hanzi, so they can't confirm if the punctuation marks could also be used in Jianzi musical scores. We think there is no need to add the annotation for these four punctuation marks in the code charts, but it is necessary to make the uses clearly in the corresponding UTN related to Jianzi Musical Notation or the complex ideographs in future if possible.

3.7.2. Clarification on the rendering effects

The rendering effects of the punctuation-like symbols in Jianzi musical scores are not totally the same as the current modern Han texts, especially in the vertical layout, but it is not the special thing only in Jianzi Musical Notation. Eiso has a plan to clarify the related issues on several writing systems in East Asia, so maybe this issue will be mentioned in that document in future.

4. Other issues related to encoding

The main issues have been clarified, this part shows other issues which are also important and useful for our encoding works.

4.1. Glyph change for vertical orientation

This part is related to UAX #50.

As Section 2.6 shows, one group of small-sized "characters" must be used after the repeat sign. Fig. 2.6.1 shows the vertical layout, Figs. 2.6.2 and 2.6.3 show the horizontal layout, and we can get the following easily.

Table 4.1.1 Glyphs for three pictures in Section 2.6

Horizontal Layout 1	**Horizontal Layout 2**	**Vertical Layout**
Fig. 2.6.2	Fig. 2.6.3	Fig. 2.6.1
		

And then, we can get the information similar to Columns 2 and 3 of Table 2 of UAX #50 as below.

Table 4.1.2 Glyph change of the isolated forms for vertical orientation

Horizontal	**Vertical**
	

Compared with the glyph change of 「 (U+300C) as below, we can find the glyph change of this fingering letter is very close to the repeat sign for Jianzi Musical Notation. However, this fingering letter is needed to use in a sequence for the small-sized "characters", that means we can't use the repeat sign here directly.

Table 4.1.3 Glyph change of U+300C for vertical orientation in UAX #50

Character	**Horizontal**	**Vertical**
U+300C LEFT CORNER BRACKET		

We have encoded ㇆ (U+200CD) which the source references are K4-0004 and H-8848. ㇆ (U+200CD) matches the vertical form and the horizontal form has not been encoded separately. As an ideograph, there is no glyph differences between the horizontal and vertical orientations, that means we will meet the duplicates for this fingering letter and the separated ㇆ (U+200CD), if we encode this fingering letter separated from ㇆ (U+200CD).

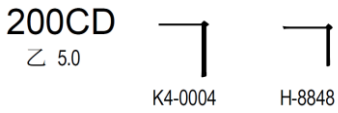


Fig. 4.1 U+200CD

We suggest unify this fingering letter with ㇆ (U+200CD) better. If we can't define the glyph change for an individual ideograph, we can try to register a special SVS or IVS which could be defined with the glyph change; if still not, we need to try to use 「 (U+300C) in the small-sized "characters" sequence. Note that one of the `Script_Extensions` property values for 「 (U+300C) is `Hani`.

Table 4.1.4 Script_Extensions for U+300C

```
300C          ; Bopo Hang Hani Hira Kana Yiii # Ps      LEFT CORNER BRACKET
```

4.2. Bidi

For this issue, we should also mainly focus on the fingering letter mentioned in Section 4.1.

There are two parts in `BidiMirroring.txt`. The first part is the bidi mirroring pairs for the `Bidi_Mirroring_Glyph` property, and the second part is the glyph changes for some characters in the bidi mirroring behaviors. 「 (U+300C) is listed in the first part as below.

```
300C; 300D # [BEST FIT] LEFT CORNER BRACKET
300D; 300C # [BEST FIT] RIGHT CORNER BRACKET
```

It means the glyph for this fingering letter should be changed to match the bidi mirroring form of 「 (U+300C) when it is used in the mixed running texts which the main scripts are the right-to-left ones. For example, one publisher needs to introduce Jianzi Musical Notation by current Uyghur, Kazakh and Kyrgyz writing systems used in China, the bidi mirroring form is necessary. Note that Fig. 4.2 shows the classic Guqin version of one famous Uyghur folk song. In fact, 」 (U+300D) is also used in Mr. Gong Yi's (龚一) books for the modern horizontal layout with 「 (U+300C) together like the current modern Han texts, who is the master's guide at Shanghai Conservatory of Music and the contemporary renamed Guqin performer, but his innovative usage has not been accepted by other Guqin musicians and researchers widely yet.

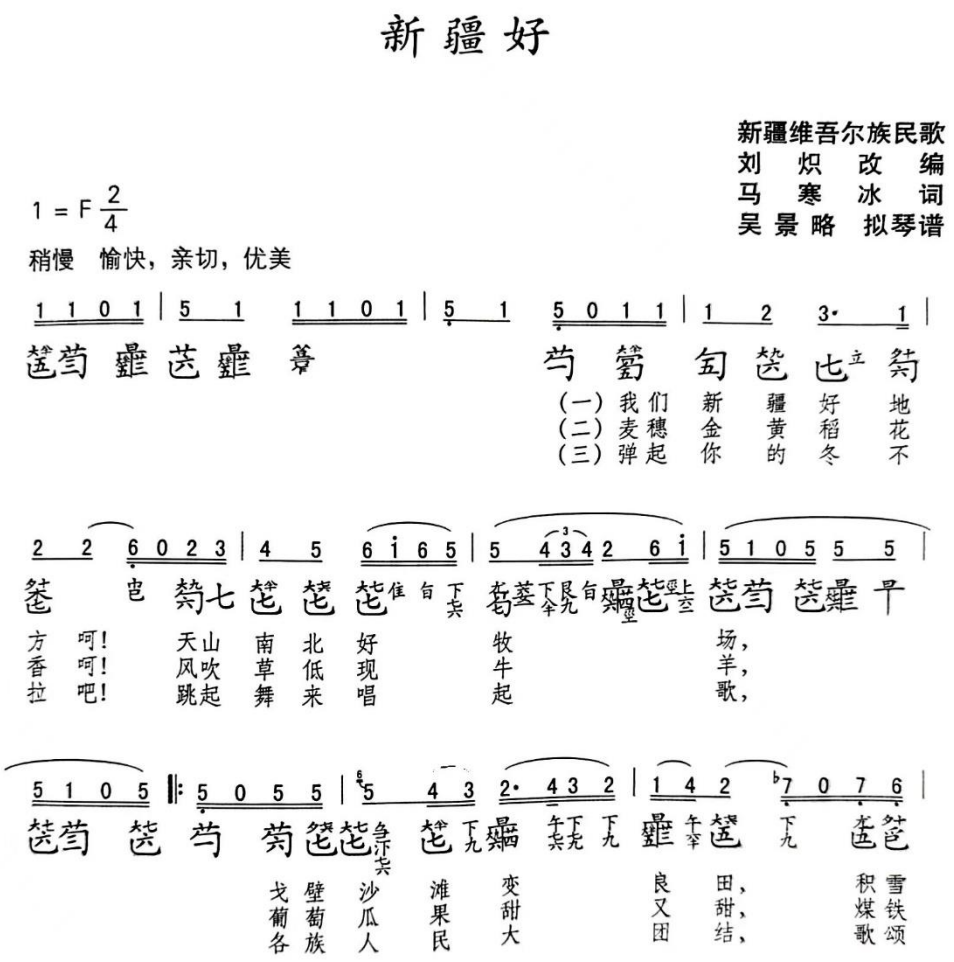


Fig. 4.2 Qīxiánqín Jiàocái, p. 209

By the way, the bidi behavior of 。 (U+3002) is also needed to clarify, which will be included in Eiso's future document mentioned in Section 3.7.2.

4.3. Confusables

One cluster of the big-sized “character” is supported by one sequence, but some elements are also the same as some ideographic components, that means the shapes of the results of some big-sized “characters” look the same or similar as other separately encoded CJKUI.

In Table 4.3.1, the results of the big-sized “characters” share the same glyphs with some source references under the relevant CJKUI. Sample 1 through 3 all correspond to the existed CJKUI, and other strings under the same fingering letter have not shared the shapes of the relevant CJKUI currently. Sample 4 also corresponds to one existed CJKUI like the previous three. For the last sample, the relevant CJKUI is in IRG WS2021, which will be encoded in a new CJK extension in future.

In Table 4.3.2, the results of the big-sized “characters” don’t share the same glyphs with any source reference under the relevant CJKUI, but the glyphs look similar. For Sample 1 and 2, the component 七 and 匕 are UCV #141 as Level 2 as Fig. 4.3 shows, but the component 匕 of 尼 (U+5C3C) and 泥 (U+6CE5) have not been written as 七 for any source and IVS now. For Sample 3, the component 罒 and 皿 are totally different, but they look similar for very small sizes. For Sample 4, the glyph of the big-sized “character” share the same glyph with VS18 (ADOBE-JAPAN1 CID+6324) and VS21 (HANYO-DENSHI FT1981; MOJI_JOHO MJ021517) forms of 芍 (U+828D), which is also a common form of 芍 (U+828D) in the ancient books. This is why Jiǎ Bǎoyù (贾宝玉) identified 芍 (散勾一弦) as 芍 (U+828D) mentioned in Fig. 0.1.5.

Table 4.3.1 Samples of same shapes between big-sized “characters” and CJKUI

Stream	Result	Relevant CJKUI	Relevant Source
尸IVD一	尸	U+30370 尸	U
尸IVD二	尸	U+21C25 𡰥	GPTV
尸IVD三	尸	U+30372 尸	G
巛IVD七	巛	U+2D5FA 巛	S
氵IVD一IVD三	氵	WS2021-01992 ⿰氵三	G

Table 4.3.2 Samples of similar shapes between big-sized “characters” and CJKUI

Stream	Result	Relevant CJKUI	IVS with Same Shape
尸IVD七	尼	U+5C3C 尼	
氵IVD尸IVD七	泥	U+6CE5 泥	
木IVD四	杢	U+3B57 杢	
艹IVD勹IVD一	芍	U+828D 芍	VS18 (芍) VS21(芍)

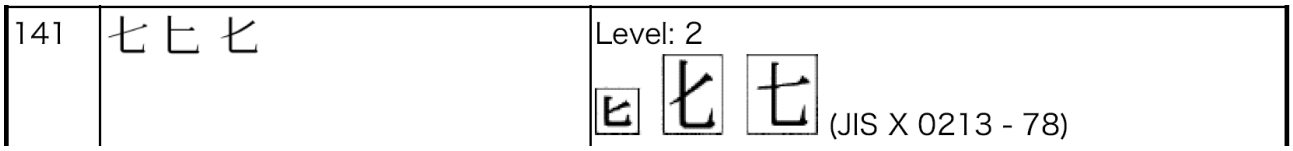


Fig. 4.3 UCV #141

There are also the similar issues for Khitan Small Script. Table 4.3.3 shows two samples which the results of the Khitan Small Script phonogram clusters share the same or similar glyphs with some source references under the relevant CJKUI, but there is not any useful clarification in Unicode Standard now. Table 4.3.4 shows the corresponding confusables information for UTR #39.

Table 4.3.3 Samples of similar shapes between Khitan small script phonogram clusters and CJKUI

Sequence	Stream	Result	Relevant CJKUI	Relevant Source
<18B46,18BE5>	木几	机	U+673A 机	GHJKPTV
<18B46,16FE4,18B46,18B46>	木[illegible]木木	木 林	U+68EE 森	GHJKPTV

Table 4.3.4 Confusables information for UTR #39 based on Table 4.3.3

```
#   机   木几
    ( 机 )   673A     CJK UNIFIED IDEOGRAPH-673A
←   ( 木几 )18B46 18BE5 KHITAN SMALL SCRIPT CHARACTER-18B46, KHITAN SMALL
SCRIPT CHARACTER-18BE5
#   森   木[illegible]木木
    ( 森 )   68EE     CJK UNIFIED IDEOGRAPH-68EE
←   ( 木[illegible]木木 )18B46 16FE4 18B46 18B46     KHITAN SMALL SCRIPT CHARACTER-
18B46, KHITAN SMALL SCRIPT FILLER, KHITAN SMALL SCRIPT CHARACTER-18B46,
KHITAN SMALL SCRIPT CHARACTER-18B46
```

On the other hand, Andrew West has submitted the document for the encoding of Jurchen script as WG2 N5207 (=L2/23-068). Based on our knowledge on Jurchen script, there are also the similar issues, such as current *U+19060 (p. 80 of WG2 N5207) and U+4ED4 (仔). And few Jurchen characters also looks like the Jianzi Fingering Letters or the sequences for Jianzi Musical Notation.

If Table 4.3.4 could be accepted by UTC, we will provide the similar table based on Table 4.3.1 and 4.3.2 when the code points and character names of all the proposed characters are confirmed and stable. All the Jianzi Fingering letters will be treated as CJKUIs, so there is no need to create a table on the confusables between Jianzi Fingering Letters and Khitan Small Script characters and Jurchen characters, but it is necessary to create a table on the confusables for the sequences between Jianzi Musical Notation or other complex CJKUI and Khitan Small Script and possible Jurchen.

4.4. Line-breaking

In the running scores of Jianzi Musical Notation, the small-sized "characters" could appear at the beginning of one visual line, that means there is no prohibited character processing rule (aka *kinsoku shori*/禁則処理 in Japanese) to make the line-breaking behaviors like the punctuation marks. Fig. 4.4.1 shows the small-sized "characters" appear at the beginning of one visual line for the horizontal layout, and Fig. 4.4.2 shows the small-sized "characters" appear at the beginning of one visual line for the vertical layout.

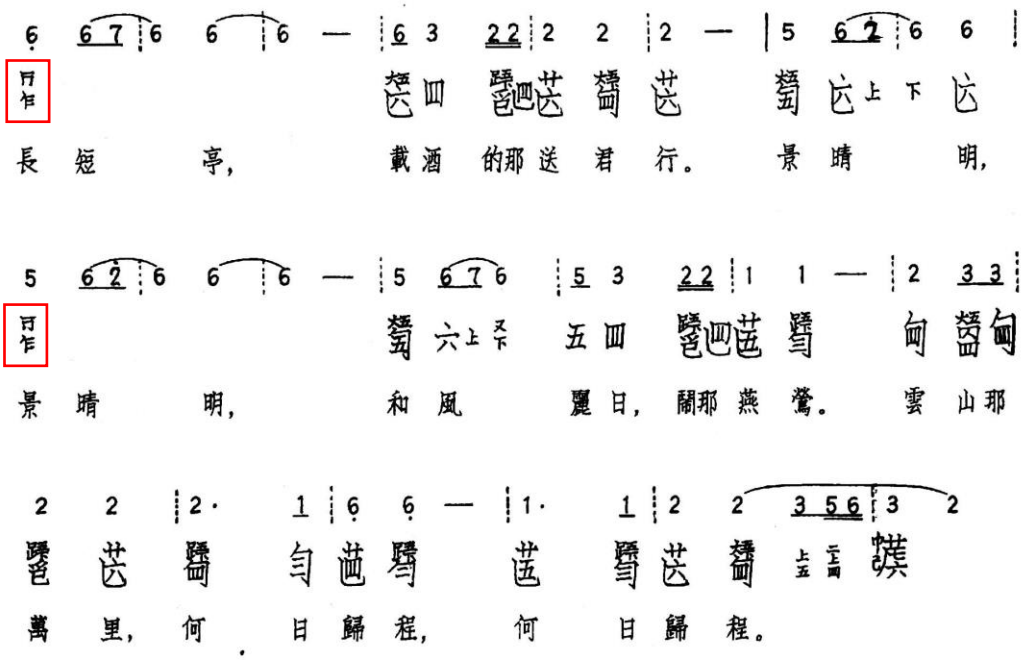


Fig. 4.4.1 Xiángē Yǎyùn, p. 8

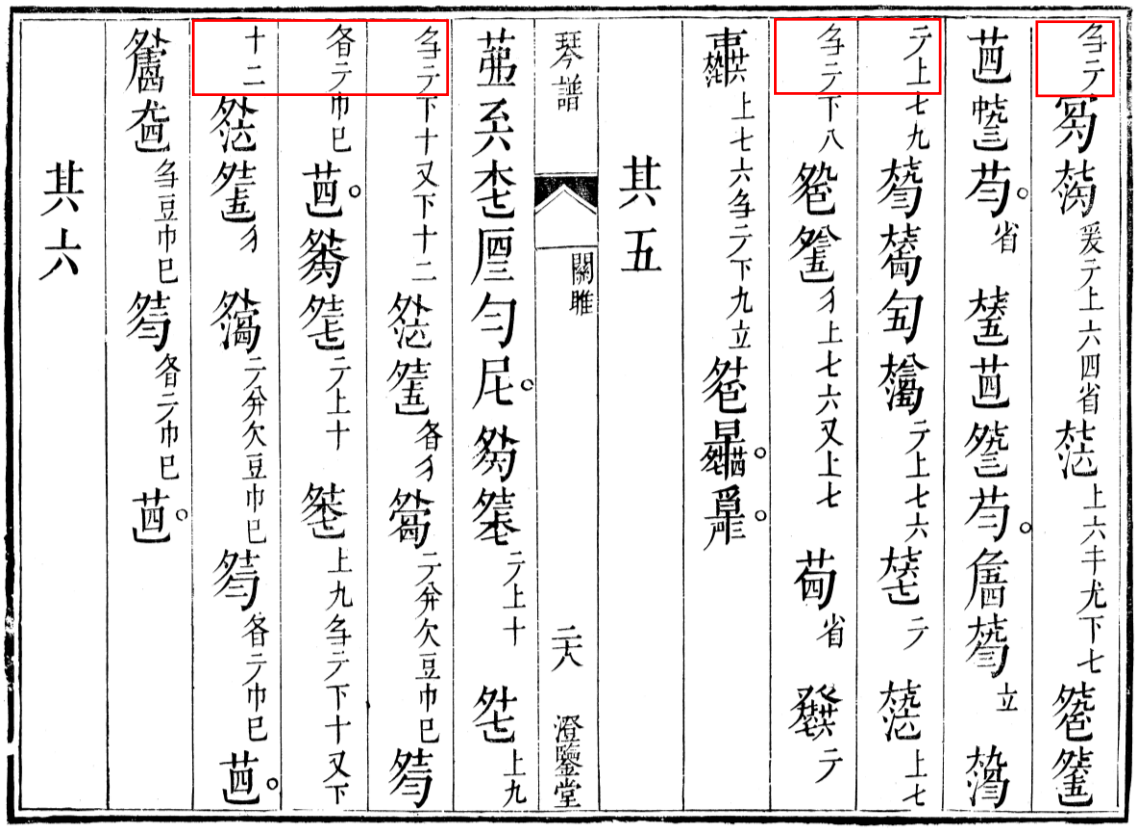


Fig. 4.4.2 Chéngjiàntáng Qínpǔ, juan 3, folio 28

Based on the encoding model, we can abstract the `Line_Break` properties for the format controls as below.

Table 4.4.1 `Line_Break` Properties for four format controls

Glyph				
				
Abbr.	IDJ/JZFJ	IDV/JZPJ	IDF/JZFR	ISF/JZSF
C/P	*U+XXXa	*U+XXXb	*U+XXXc	*U+XXXd
Line_Break Property	CM	CM	ID	CM

The followings should be the information of the format controls for `LineBreak.txt`.

Table 4.4.2 Information for `LineBreak.txt`

```
XXXa..XXXb;CM     # Cf     [2] IDEOGRAPHIC JOINER..IDEOGRAPHIC VIRAMA
XXXc;ID          # Lo        IDEOGRAPHIC FILLER
XXXd;CM          # Cf        IDEOGRAPHIC SMALL-SIZED FORM SIGN
```

5. Complex typographic layout

Multi-script layout or multi-writing system layout is a common and hot typesetting or typographic issue or topic in the real world recently, but we notice some discussants and researchers confuse various kinds of situations. We need to delimit the scope for further discussion first when we discuss the relevant issues on Jianzi Musical Notation.

5.1. Delimitation

In this part, we need to use the terms "script" and "writing system" as different definitions. For the term "script", we follow the usages in ISO 15924, but some mixed scripts and sub-scripts are excluded for the following discussions, such as `Hanb` (Han with Bopomofo), `Jpan` (Japanese as Han + Hiragana + Katakana) and so on. Note that the punctuation marks are treated as a natural part of the corresponding main script. For the writing system, we basically follow the usages in ISO 639-4 and ScriptSource, which are related to the corresponding languages or dialects and music closely, and sometimes the orthographies and regional conventions are also important. For example, Chinese written with Han script used in Chinese mainland (`zh-Hani-CN` or `zho-Hani-CN`) and Japanese written with Han script (without Hiragana, Katakana) used in Japanese main islands (`ja-Hani-JP` or `jpn-Hani-JP`, such as some ancient Japanese texts or so-called "fake Chinese") share some parts on the script for encoding characters, but they record different languages and there are different conventions on the specific shapes or letterforms for the same characters, that means they are the different writing systems.

5.1.1. Inline multi-scripts layout

In our daily life in China, some loaned words from other languages in their original form have become the integral parts every day. The Chinese native speakers can identify them from the running texts easily, that means it is not stable to treat them as a part of current modern writing Chinese, but it is necessary to treat them as an indispensable part of contemporary Chinese vocabulary for the Chinese native speakers' language activities. In fact, we can clarify them as the following types.

1) More necessary words, like NBA, BBC and so many file format names. If the native speakers don't use them, they need to use the long native Chinese translation word but inconvenient to remember. NBA could be translated into 美国篮球职业联盟 for the association itself, and 美国职业篮球联赛 for the league which could be abbreviated as 美职篮 in Chinese, but they have been not used widely now.

2) Necessary words for specific social group, like "high tea". The phrase "high tea" used in Hong Kong SAR and Guangdong Province is not exactly the same with UK, which is closer to "afternoon tea". This life style has been accepted by other persons lived out of these two places, and they use the corresponding Chinese word of "afternoon tea" as 下午茶 (xiàwǔchá/haa6 ng5 ca4).

3) Name of some enterprises or social organizations, like Netflix, Unicode and so on. In China, Netflix is often called as "奈飞" (Nàifēi) or "网飞" (Wǎngfēi, note that "net" means "网") in Chinese, but Netflix only keep "Netflix" in different writing system as their name, such as "Netflix Original" is translated into "Netflix 原創影集" in Chinese speaking region. (This part has been confirmed by Lee Collins.)

4) Academic annotation. Some academic articles and technical documents include the original form of some words in the following brackets, which will make the users to search more information more easily. This document is also a good example on this.

The above explanations are related to Han script and Latin script, and there would be the similar situations among any multi scripts, but there is only one is the main script and which one is the main doesn't depend on the distribution and quantity of words.

If there will be an English or French or Zhuang paper or book to introduce the Jianzi Musical Notation, we

will meet the multi-scripts between Latin script and the corresponding script of Jianzi Musical Notation, and the main script is Latin script; if there will be a Chinese current Kazakh paper or book to introduce the Jianzi Musical Notation, we will meet the multi-scripts between Arabic script and the corresponding script of Jianzi Musical Notation, and the main script is Arabic script; if there will be a Tai Nüa paper with Dehong or Xinping orthography to introduce the Jianzi Musical Notation, we will meet the multi-scripts between Tai Le script and the corresponding script of Jianzi Musical Notation, and the main script is Tai Le script; and so on.
Please also see Section 3.2 of JLREQ, Section 3.2 of CLREQ and Section 3.3 of KLREQ, which they use the term as “mixed text” or “mixed writing” (混植/混排/섞어짜기) for this part. We also notice that this term is also used as “혼식문” in modern Korean in ROK.

5.1.2. Inline multi-writing systems layout

The actual situation is similar to Section 5.1.1. Current English writing system (`en-Latn` or `eng-Latn`) and Hànyǔ Pīnyīn (`zh-Latn` or `zho-Latn`, also see ISO 7098) share the same script, but they are different writing systems, and the conventions are not the same. Similar to this situation, the following picture shows the main writing system is Chinese, and Japanese is used as the academic annotation in the brackets like 4) in Section 5.1.1, for example, in Fig. 5.1.2, two 新 (U+65B0) on Line 2 are must be unifiable under the UCV rule in IRG, and the one with the red underline follows PRC conventions for the main writing system, and the one with the blue underline follows Japan conventions for the academic annotation. Two sets of glyphs both belong to a big family Hanyi XuanSong (汉仪玄宋).

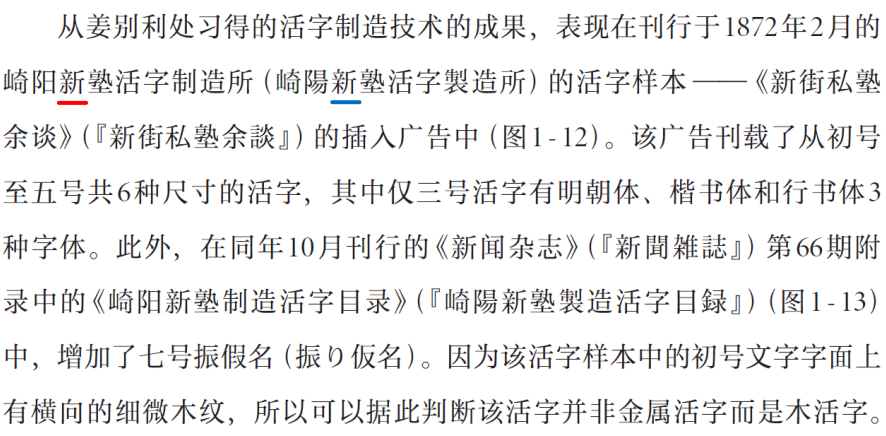

从姜别利处习得的活字制造技术的成果，表现在刊行于1872年2月的崎阳新塾活字制造所（崎陽新塾活字製造所）的活字样本——《新街私塾余谈》（『新街私塾余談』）的插入广告中（图1-12）。该广告刊载了从初号至五号共6种尺寸的活字，其中仅三号活字有明朝体、楷书体和行书体3种字体。此外，在同年10月刊行的《新闻杂志》（『新聞雑誌』）第66期附录中的《崎阳新塾制造活字目录》（『崎陽新塾製造活字目録』）（图1-13）中，增加了七号振假名（振り仮名）。因为该活字样本中的初号文字字面上有横向的细微木纹，所以可以据此判断该活字并非金属活字而是木活字。

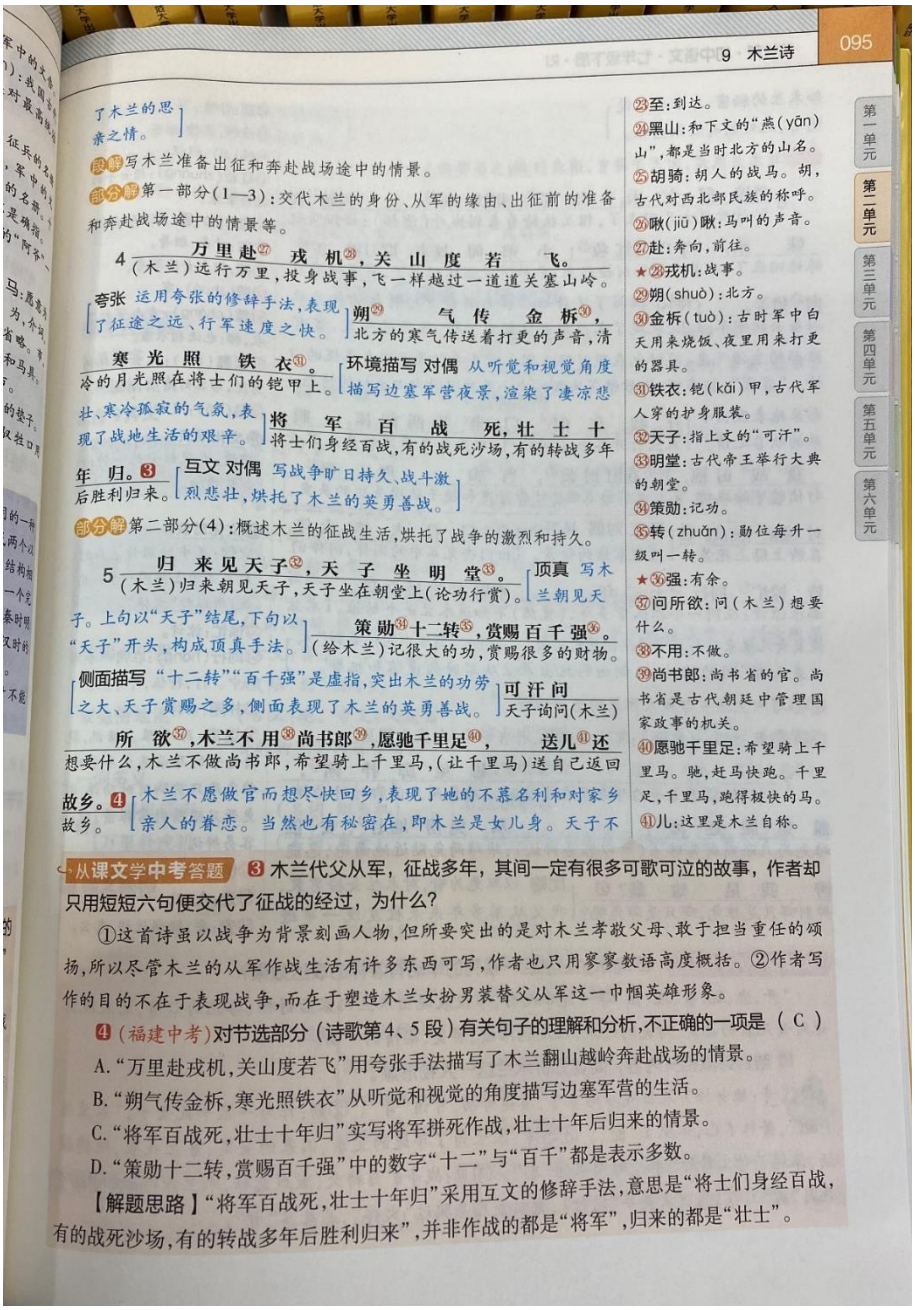
Fig. 5.1.2 Fāngcùn Zhījiān, p. 25

If there will be a modern Chinese paper or book to introduce the Jianzi Musical Notation, we will meet the multi-writing systems between modern Chinese with the PRC conventions and Jianzi Musical Notation with its common conventions; if there will be a modern Japanese paper or book to introduce the Jianzi Musical Notation, we will meet the multi-writing systems between modern Japanese with the Japan conventions and Jianzi Musical Notation with its common conventions; and so on.

5.1.3. Multiline mono-script or mono-writing system layout

Multiline layout is a practical form for literary, linguistic materials and musical scores.
This form is often used in ancient articles that require full text explanation. The reader can know the original text of the ancient article, and they can also know the modern meaning. Figs. 5.1.3.1 and 5.1.3.3 show the upper line is the original literary Chinese text, and the lower line is the modern Chinese text with the same meaning. There are several interlinear explanatory notes in Fig. 5.1.3.1, but there is other explanatory note form in Fig. 5.1.3.3, which is like ruby annotation form mentioned in Sections 2.5 and 3.6, but not totally the same. These two pictures are both cited from the educational tutoring materials, and the corresponding

textbooks are listed as Figs. 5.1.3.2 and 5.1.3.4, which there are only the annotations for some hard words.



9 木兰诗 095

了木兰的思亲之情。

段解 写木兰准备出征和奔赴战场途中的情景。

部分解 第一部分(1—3):交代木兰的身份、从军的缘由、出征前的准备和奔赴战场途中的情景等。

4 万里赴㉗戎机㉘,关山度若飞。
(木兰)远行万里,投身战事,飞一样越过一道道关塞山岭。

夸张 运用夸张的修辞手法,表现了征途之远、行军速度之快。

朔㉙气传金柝㉚,寒光照铁衣㉛。
北方的寒气传送着打更的声音,清冷的月光照在将士们的铠甲上。

环境描写 对偶 从听觉和视觉角度描写边塞军营夜景,渲染了凄凉悲壮、寒冷孤寂的气氛,表现了战地生活的艰辛。

将军百战死,壮士十年归。❸
将士们身经百战,有的战死沙场,有的转战多年后胜利归来。

互文 对偶 写战争旷日持久、战斗激烈悲壮,烘托了木兰的英勇善战。

部分解 第二部分(4):概述木兰的征战生活,烘托了战争的激烈和持久。

5 归来见天子㉜,天子坐明堂㉝。
(木兰)归来朝见天子,天子坐在朝堂上(论功行赏)。

顶真 写木兰朝见天子。上句以"天子"结尾,下句以"天子"开头,构成顶真手法。

策勋㉞十二转㉟,赏赐百千强㊱。
(给木兰)记很大的功,赏赐很多的财物。

侧面描写 "十二转""百千强"是虚指,突出木兰的功劳之大、天子赏赐之多,侧面表现了木兰的英勇善战。

可汗问
天子询问(木兰)

所欲㊲,木兰不用㊳尚书郎㊴,愿驰千里足㊵,送儿㊶还故乡。❹
想要什么,木兰不做尚书郎,希望骑上千里马,(让千里马)送自己返回故乡。

木兰不愿做官而想尽快回乡,表现了她的不慕名利和对家乡亲人的眷恋。当然也有秘密在,即木兰是女儿身。天子不

㉓至:到达。
㉔黑山:和下文的"燕(yān)山",都是当时北方的山名。
㉕胡骑:胡人的战马。胡,古代对西北部民族的称呼。
㉖啾(jiū)啾:马叫的声音。
㉗赴:奔向,前往。
★㉘戎机:战事。
㉙朔(shuò):北方。
㉚金柝(tuò):古时军中白天用来烧饭、夜里用来打更的器具。
㉛铁衣:铠(kǎi)甲,古代军人穿的护身服装。
㉜天子:指上文的"可汗"。
㉝明堂:古代帝王举行大典的朝堂。
㉞策勋:记功。
㉟转(zhuǎn):勋位每升一级叫一转。
★㊱强:有余。
㊲问所欲:问(木兰)想要什么。
㊳不用:不做。
㊴尚书郎:尚书省的官。尚书省是古代朝廷中管理国家政事的机关。
㊵愿驰千里足:希望骑上千里马。驰,赶马快跑。千里足,千里马,跑得极快的马。
㊶儿:这里是木兰自称。

第一单元 第二单元 第三单元 第四单元 第五单元 第六单元

从课文学中考答题 ❸ 木兰代父从军,征战多年,其间一定有很多可歌可泣的故事,作者却只用短短六句便交代了征战的经过,为什么?

①这首诗虽以战争为背景刻画人物,但所要突出的是对木兰孝敬父母、敢于担当重任的颂扬,所以尽管木兰的从军作战生活有许多东西可写,作者也只用寥寥数语高度概括。②作者写作的目的不在于表现战争,而在于塑造木兰女扮男装替父从军这一巾帼英雄形象。

❹ (福建中考)对节选部分(诗歌第4、5段)有关句子的理解和分析,不正确的一项是(C)

A. "万里赴戎机,关山度若飞"用夸张手法描写了木兰翻山越岭奔赴战场的情景。

B. "朔气传金柝,寒光照铁衣"从听觉和视觉的角度描写边塞军营的生活。

C. "将军百战死,壮士十年归"实写将军拼死作战,壮士十年后归来的情景。

D. "策勋十二转,赏赐百千强"中的数字"十二"与"百千"都是表示多数。

【解题思路】"将军百战死,壮士十年归"采用互文的修辞手法,意思是"将士们身经百战,有的战死沙场,有的转战多年后胜利归来",并非作战的都是"将军",归来的都是"壮士"。

Fig. 5.1.3.1 Jiàocáibāng - Chūzhōng Yǔwén Qī-Niánjí Xiàcè (RJ) 2023 Chūn, p. 95

万里赴戎机[①]，关山度若飞[②]。朔气传金柝[③]，寒光照铁衣[④]。将军百战死，壮士十年归。

归来见天子[⑤]，天子坐明堂[⑥]。策勋十二转[⑦]，赏赐百千强[⑧]。可汗问所欲[⑨]，木兰不用尚书郎[⑩]，愿驰千里足[⑪]，送儿还故乡。



爷娘闻女来，出郭[⑫]相扶将[⑬]；阿姊闻妹来，当户理红妆[⑭]；小弟闻姊来，磨刀霍霍[⑮]向猪羊。开我东阁门，坐我西阁床。脱我战时袍，著[⑯]我旧时裳。当窗理云鬓[⑰]，对镜帖[⑱]花黄[⑲]。出门看火伴[⑳]，火伴皆惊忙：同行十二年，不知木兰是女郎。

雄兔脚扑朔，雌兔眼迷离[㉑]；双兔傍地走，安能辨我是雄雌[㉒]？

---

①〔万里赴戎机〕远行万里，投身战事。戎机，战事。

②〔关山度若飞〕像飞一样地越过一道道关塞山岭。度，越过。

③〔朔（shuò）气传金柝（tuò）〕北方的寒气传送着打更的声音。朔，北方。金柝，古时军中白天用来烧饭、夜里用来打更的器具。

④〔铁衣〕铠（kǎi）甲，古代军人穿的护身服装。

⑤〔天子〕指上文的“可汗”。

⑥〔明堂〕古代帝王举行大典的朝堂。

⑦〔策勋十二转（zhuǎn）〕记很大的功。策勋，记功。转，勋位每升一级叫一转。

⑧〔赏赐百千强〕赏赐很多的财物。强，有余。

⑨〔问所欲〕问（木兰）想要什么。

⑩〔尚书郎〕尚书省的官。尚书省是古代朝廷中管理国家政事的机关。

⑪〔愿驰千里足〕希望骑上千里马。驰，赶马快跑。

⑫〔郭〕外城。

⑬〔扶将〕扶持。

⑭〔红妆（zhuāng）〕指女子的艳丽装束。

⑮〔霍（huò）霍〕磨刀的声音。

⑯〔著（zhuó）〕穿。

⑰〔云鬓（bìn）〕像云那样的鬓发，形容好看的头发。

⑱〔帖〕同“贴”。

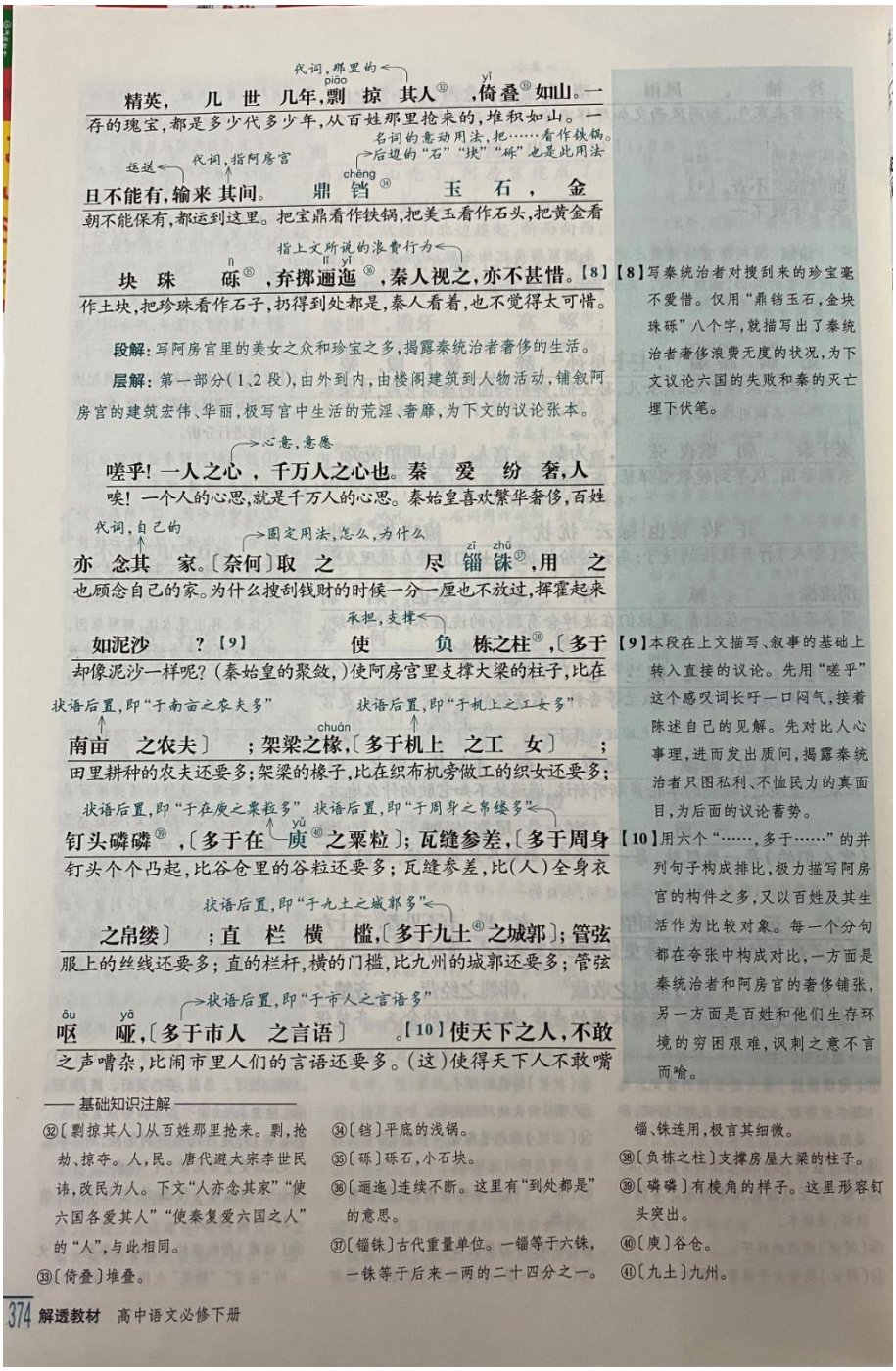
⑲〔花黄〕古代妇女的一种面部装饰物。

⑳〔火伴〕军中的同伴。当时规定若干士兵同一个灶吃饭，所以称“火伴”。

㉑〔雄兔脚扑朔，雌兔眼迷离〕据说，提着兔子的耳朵悬在半空时，雄兔两只前脚时时动弹，雌兔两只眼睛时常眯着，所以容易辨认。扑朔，动弹。迷离，眯着眼。

㉒〔双兔傍地走，安能辨我是雄雌〕雄雌两兔贴近地面跑，怎能辨别哪只是雄兔，哪只是雌兔呢？傍，靠近、临近。走，跑。

Fig. 5.1.3.2 Yìwù Jiàoyù Jiàokēshū Yǔwén Qīniánjí Xiàcè, p. 48



精英，几世几年，剽(piào)掠其人[32]，倚(yǐ)叠[33]如山。一存的瑰宝，都是多少代多少年，从百姓那里抢来的，堆积如山。一

旦不能有，输来其间。鼎铛(chēng)[34]玉石，金朝不能保有，都运到这里。把宝鼎看作铁锅，把美玉看作石头，把黄金看

块珠砾(lì)[35]，弃掷逦迤(lǐ yǐ)[36]，秦人视之，亦不甚惜。[8]作土块，把珍珠看作石子，扔得到处都是，秦人看着，也不觉得太可惜。

段解：写阿房宫里的美女之众和珍宝之多，揭露秦统治者奢侈的生活。

层解：第一部分(1、2段)，由外到内，由楼阁建筑到人物活动，铺叙阿房宫的建筑宏伟、华丽，极写宫中生活的荒淫、奢靡，为下文的议论张本。

嗟乎！一人之心，千万人之心也。秦爱纷奢，人

唉！一个人的心思，就是千万人的心思。秦始皇喜欢繁华奢侈，百姓

亦念其家。〔奈何〕取之尽锱铢(zī zhū)[37]，用之

也顾念自己的家。为什么搜刮钱财的时候一分一厘也不放过，挥霍起来

如泥沙？[9]使负栋之柱[38]，〔多于

却像泥沙一样呢？(秦始皇的聚敛，)使阿房宫里支撑大梁的柱子，比在

南亩之农夫〕；架梁之椽(chuán)，〔多于机上之工女〕；

田里耕种的农夫还要多；架梁的椽子，比在织布机旁做工的织女还要多；

钉头磷磷[39]，〔多于在庾(yǔ)[40]之粟粒〕；瓦缝参差，〔多于周身

钉头个个凸起，比谷仓里的谷粒还要多；瓦缝参差，比(人)全身衣

之帛缕〕；直栏横槛，〔多于九土[41]之城郭〕；管弦

服上的丝线还要多；直的栏杆，横的门槛，比九州的城郭还要多；管弦

呕(ōu)哑(yā)，〔多于市人之言语〕。[10]使天下之人，不敢

之声嘈杂，比闹市里人们的言语还要多。(这)使得天下人不敢嘴

【8】写秦统治者对搜刮来的珍宝毫不爱惜。仅用“鼎铛玉石，金块珠砾”八个字，就描写出了秦统治者奢侈浪费无度的状况，为下文议论六国的失败和秦的灭亡埋下伏笔。

【9】本段在上文描写、叙事的基础上转入直接的议论。先用“嗟乎”这个感叹词长吁一口闷气，接着陈述自己的见解。先对比人心事理，进而发出质问，揭露秦统治者只图私利、不恤民力的真面目，为后面的议论蓄势。

【10】用六个“……，多于……”的并列句子构成排比，极力描写阿房宫的构件之多，又以百姓及其生活作为比较对象。每一个分句都在夸张中构成对比，一方面是秦统治者和阿房宫的奢侈铺张，另一方面是百姓和他们生存环境的穷困艰难，讽刺之意不言而喻。

——基础知识注解

㉜〔剽掠其人〕从百姓那里抢来。剽，抢劫、掠夺。人，民。唐代避太宗李世民讳，改民为人。下文“人亦念其家”“使六国各爱其人”“使秦复爱六国之人”的“人”，与此相同。

㉝〔倚叠〕堆叠。

㉞〔铛〕平底的浅锅。

㉟〔砾〕砾石，小石块。

㊱〔逦迤〕连续不断。这里有“到处都是”的意思。

㊲〔锱铢〕古代重量单位。一锱等于六铢，一铢等于后来一两的二十四分之一。锱、铢连用，极言其细微。

㊳〔负栋之柱〕支撑房屋大梁的柱子。

㊴〔磷磷〕有棱角的样子。这里形容钉头突出。

㊵〔庾〕谷仓。

㊶〔九土〕九州。

Fig. 5.1.3.3 Jiětòu Jiàocái - Gāozhōng Yǔwén Bìxiū Xiàcè, p. 374

涨膩[1]，弃脂水也；烟斜雾横，焚椒兰[2]也。雷霆乍惊，宫车过也；辘轳远听[3]，杳不知其所之也。一肌一容，尽态极妍[4]，缦立[5]远视，而望幸焉。有不见者，三十六年[6]。燕赵之收藏[7]，韩魏之经营，齐楚之精英，几世几年，剽掠其人[8]，倚叠[9]如山。一旦不能有，输来其间。鼎铛玉石，金块珠砾[10]，弃掷逦迤[11]，秦人视之，亦不甚惜。

嗟乎！一人之心，千万人之心也。秦爱纷奢，人亦念其家。奈何取之尽锱铢，用之如泥沙？使负栋之柱[12]，多于南亩之农夫；架梁之椽，多于机上之工女；钉头磷磷[13]，多于在庾[14]之粟粒；瓦缝参差，多于周身之帛缕；直栏横槛，多于九土[15]之城郭；管弦呕哑，多于市人之言语。使天下之人，不敢言而敢怒。独夫[16]之心，日益骄固[17]。戍卒叫[18]，函谷举，楚人一炬[19]，可怜焦土！

呜呼！灭六国者六国也，非秦也；族[20]秦者秦也，非天下也。嗟乎！使六国各爱其人，则足以拒秦；使秦复爱六国之人，则递[21]三世可至万世而为君，谁得而族灭也？秦人不暇自哀，而后人哀之；后人哀之而不鉴之，亦使后人而复哀后人也。



阿房宫图 〔清〕袁耀 作

①〔涨膩〕涨起了脂膏。下文“脂水”，指含有脂粉的洗脸水。
②〔椒兰〕两种香料植物，焚烧以熏香衣物。
③〔辘轳远听〕车声越听越远。辘轳，车行的声音。
④〔一肌一容，尽态极妍〕肌肤、姿容都娇媚极了。
⑤〔缦立〕久立。
⑥〔三十六年〕指嬴政在位期间（前247—前210）。
⑦〔收藏〕指收藏的金玉珍宝等物。下文的“经营”“精英”也指金玉珍宝等物。
⑧〔剽（piāo）掠其人〕从百姓那里抢来。剽，抢劫、掠夺。
⑨〔倚叠〕堆叠。
⑩〔鼎铛（chēng）玉石，金块珠砾〕把宝鼎看作铁锅，把美玉看作石头，把黄金看作土块，把珍珠看作石子。铛，平底的浅锅。
⑪〔逦迤〕连续不断。这里有“到处都是”的意思。
⑫〔负栋之柱〕支撑房屋大梁的柱子。
⑬〔磷磷〕有棱角的样子。这里形容钉头突出。
⑭〔庾〕谷仓。
⑮〔九土〕九州。
⑯〔独夫〕残暴无道、失去人心的统治者。这里指秦始皇。
⑰〔骄固〕骄横顽固。
⑱〔戍卒叫〕指陈涉、吴广起义。
⑲〔楚人一炬〕指项羽占领咸阳后纵火焚烧秦宫室。
⑳〔族〕灭族。
㉑〔递〕依次传递。

Fig. 5.1.3.4 Pǔtōng Gāozhōng Jiàokēshū Yǔwén Bìxiū Xiàcè, p. 149

This kind is not necessary for Jianzi Musical Notation commonly.

5.1.4. Multiline multi-script or multi-writing system layout

This kind is very rare for the situation among different writing systems to record the languages and dialects, but it is very common for the situation among different Hanzi-based musical notations and other musical notations and some written languages used in Europa.

Fig. 5.1.4.1 shows one page of the textbook used for the Lisu People in China. In one line, the upper part is the modern Chinese written languages with Hanzi, the lower part is the modern Lisu written languages with Fraser script, and their meanings are the same. For example, the red square shows the Chinese word for Mount Huangshan as “黄山” (Huángshān), and the blue square shows the corresponding Lisu word as “HW:-S” (“黄山” reads as [xuã^{31} sã^{44}] in the Dali sub-dialect under Chinese Southwestern Mandarin-dialects.).

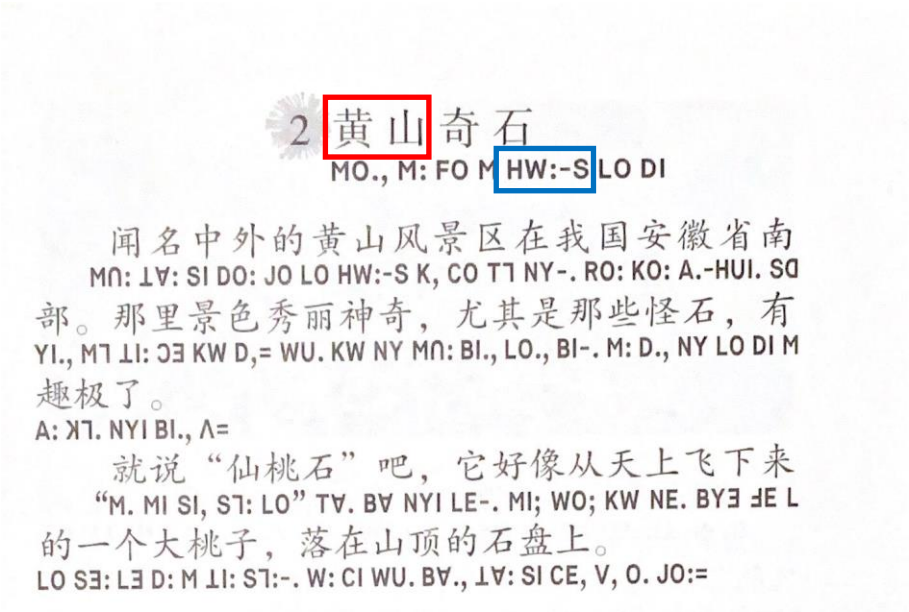


Fig. 5.1.4.1 Yìwù Jiàoyù Kèchéng Biāozhǔn Shíyàn Jiàokēshū Yǔwén Èr-niánjí Shàngcè (Hànwén — Lìsùwén Duìzhào), p. 7

L2/23-112 mentioned one special example for Korean Hanja and old Hangul, which is not common for now. The lower half part of Fig. 5.1.4.2 shows the multiline multi-script layout which the left one is for Korean Hanja and the right one is for old Hangul. The Korean Hanja on the left didn't show all the morphemes or words, but the readers could know them from the right. The Korean Hanja was set near the corresponding old Korean reading syllable.

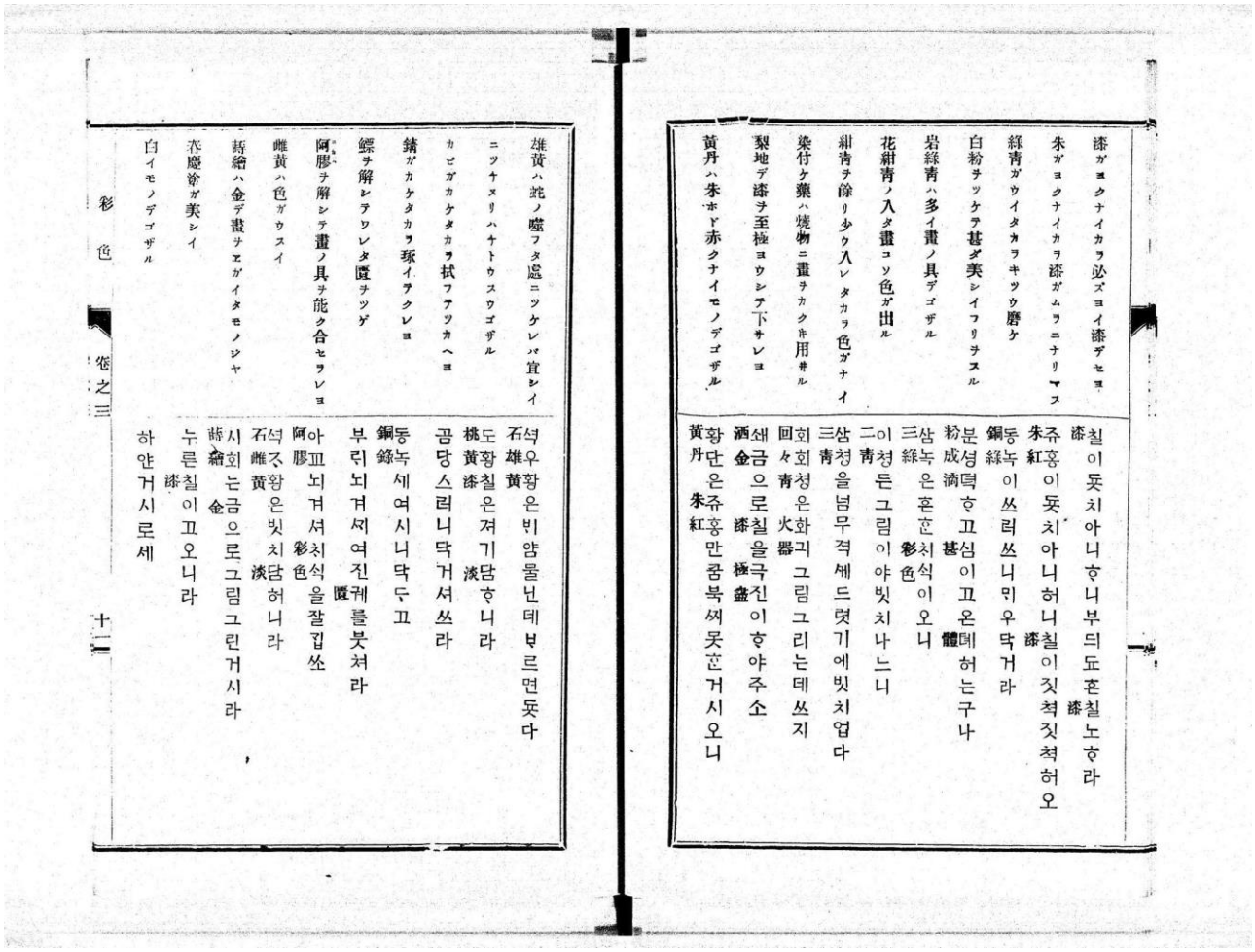


Fig. 5.1.4.2 Kou Rin Syuuchi, folios 10B & 11A
(same page as Fig. 16 of L2/23-112)

Please read more details on this kind for Jianzi Musical Notation in Section 5.2.

5.1.5. Basic comments on multiline layout

There must be more than one main writing system or musical notation in the running text or score. The meaning and grammatical structure of every main writing system or musical notation is each relatively complete. When the readers only read one of them, they can get the relatively complete effect only based on the single line.

5.2. Multiline layout related to Jianzi Musical Notation

In our collection, Jianzi Musical Notation could be used with Hanzi (as lyric), Gongche Musical Notation, staff or western musical notation, number musical notation and so on commonly. On the other hand, Jianzi Musical Notations for Guqin and Se are not exactly the same, but almost elements for Se are the subset of Guqin, and the basic rules are the same. In our collection, we also meet Jianzi Musical Notations for Guqin and Se are used as the multiline layout together.

5.2.1. Jianzi Musical Notation with Hanzi

This is the most common form for multiline layout, especially in the vertical layout, which is similar to Figs. 5.1.3.1 and 5.1.3.3. In Fig 5.2.1, the lines on Hanzi lyric and Jianzi Musical Notation appear alternately, which

the right line is for Hanzi lyric (transparent red square), and the left line is for Jianzi Musical Notation (transparent blue square). On the other hand, in the purple square, the right one means a Han ligature composed by 成 (U+6210) and 假 (U+5047).

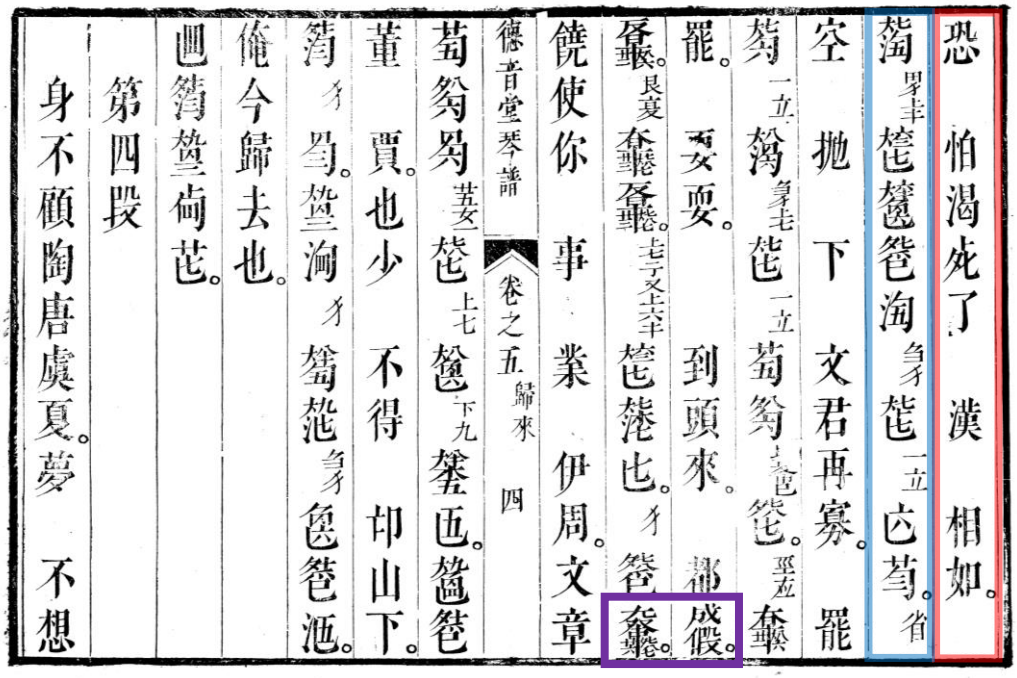


Fig. 5.2.1 Déyīntáng Qínpǔ, Book 3, juan 5, folio 33

5.2.2. Jianzi Musical Notation with Gongche Musical Notation

This form was also common since Qing Dynasty. Jianzi Musical Notation is only a kind of musical notation to record the fingerings, but the players need to know the scales, so the Gongche Musical Notation is the best one to help record the scales with Jianzi Musical Notation at that time. In Fig. 5.2.2, the lines on Gongche Musical Notation and Jianzi Musical Notation appear alternately, which the right line is for Gongche Musical Notation (transparent red square), and the left line is for Jianzi Musical Notation (transparent blue square).

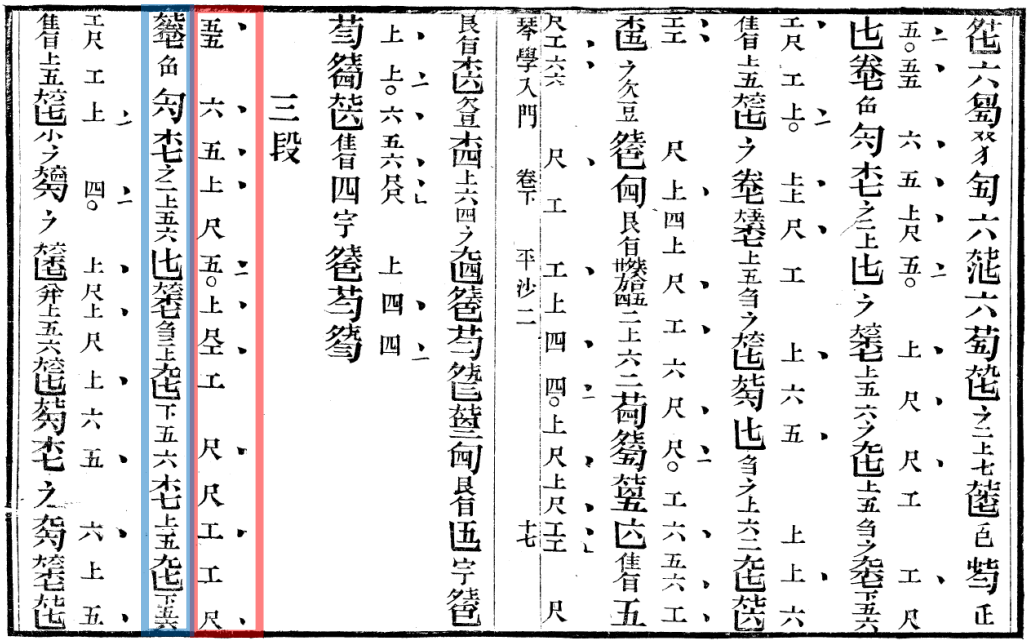


Fig. 5.2.2 Qínxué Rùmén, Book 2, juan B, folio 17

5.2.3. Jianzi Musical Notation with Chinese Ideographic Musical Notation or Literal Musical Notation

This form was used rarely, because there are very few surviving musical score for Chinese Ideographic Musical Notation or Literal Musical Notation. Fig. 0.1.4 shows a good example on this form.

5.2.4. Jianzi Musical Notation for Guqin with Se

This form was used rarely. Fig. 5.2.3 is the evidence of GT00487 which was submitted to IRG CJK_C2 collection. There are three parts on this form in the following picture (transparent green squares). The lines on Jianzi Musical Notations for Guqin and Se appear alternately, and one group is under one Hanzi, which the right line is for Jianzi Musical Notation for Guqin (transparent red square), and the left line is for Jianzi Musical Notation for Se (transparent blue square).

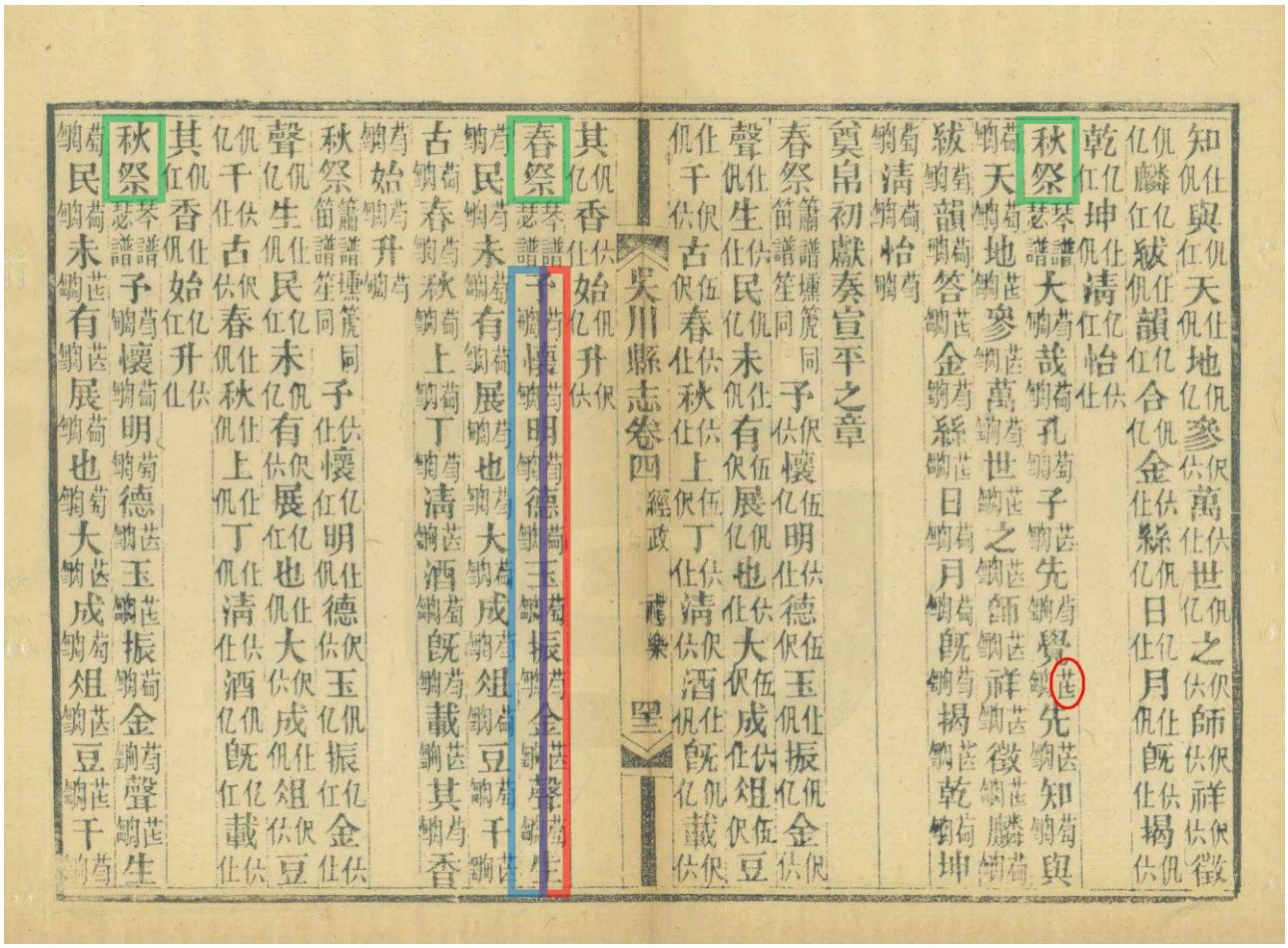


Fig. 5.2.4 Wúchuān Xiàn Zhì, juan 4 folio 42

5.2.5. Jianzi Musical Notation with staff or western musical notation, number musical notation

These forms are commonly used for the modern usages, which their functions are like Section 5.2.2 to make the players know the scales. They have been shown in this document several times, and it is very easy for the reviewers to distinguish which one is Jianzi Musical Notation, and which one is staff or western musical notation or number musical notation, so we don't show more examples as below.

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Appendix
There are 13 appendixes here.

Appendix A *Full table of the Jianzi Fingering Letters mapped to the encoded CJKUI*
This appendix is the complete version of Table 3.1.1. See `App A.pdf` and `App A.csv`.

Appendix B *Full table of the Jianzi Fingering Letters mapped to the CJKUI included in IRG WS2021*
This appendix is the complete version of Table 3.1.2. See `App B.pdf` and `App B.csv`.

Appendix C *Full table of the Jianzi Fingering Letters mapped to the unencoded characters*
This appendix is the complete version of Table 3.1.3. See `App C.pdf` and `App C.csv`.

Appendix D *Full table of the Jianzi Fingering Letters unified to the encoded CJKUI*
This appendix is related to Section 3.2.1. See `App D.pdf`.

Appendix E *Full table of the Jianzi Fingering Letters unified to the CJKUI included in IRG WS2021*
This appendix is related to Section 3.2.1. See `App E.pdf`.

Appendix F *Full table of the Jianzi Fingering Letters unified to the unencoded characters*
This appendix is related to Section 3.2.1. See `App F.pdf`.

Appendix G *Arrangement of the fingering letter lists*
This appendix is related to Section 1.1 and 3.2 which has merged the fingering letter lists of 30 ancient and modern books. It shows the evidence of the fingering letters we need to encode and the information for the fingering letters which are not suitable to encode separately. See `App G.csv` and `App G.zip`.
In `App G.csv`, there are 30 columns related to the sources (Src1 through Src30). The corresponding books of the file names of the pictures in zip file are showed as below.

Src.	Format	Book
Src1	BPZnnnnn	百瓶齋琴譜
Src2	CYTnnnnn	誠一堂琴譜
Src3	CJTnnnnn	澄鑒堂琴譜
Src4	DYTnnnnn	德音堂琴譜
Src5	JAPnnnnn	蕉盦琴譜
Src6	QHBnnnnn	琴譜合璧卷
Src7	QXCnnnnn	琴學叢書
Src8	QLYnnnnn	琴學練要
Src9	QRMnnnnn	琴學入門
Src10	WZZnnnnn	五知齋琴譜
Src11	YLLnnnnn	研露樓琴譜
Src12	LHKnnnnn	律音彙考
Src13	ZYTnnnnn	自遠堂琴譜
Src14	CCWnnnnn	藏春塢琴譜
Src15	EXQnnnnn	二香琴譜
Src16	HYMnnnnn	徽言秘旨訂
Src17	KMCnnnnn	枯木禪琴譜

Src.	Format	Book
Src18	LHTnnnnn	蓼懷堂琴譜
Src19	SHBnnnnn	文淵閣四庫全書本·琴譜合璧卷 滿漢對照
Src20	SSFnnnnn	文淵閣四庫全書本·松風閣琴譜
Src21	TWGnnnnn	天聞閣琴譜
Src22	WYLnnnnn	卧雲樓琴譜
Src23	YJLnnnnn	一經廬琴學
Src24	YGZnnnnn	與古齋琴譜
Src25	CXZnnnnn	重修真傳琴譜
Src26	GXPnnnnn	古琴新谱
Src27	GYZnnnnn	古琴演奏法
Src28	CMJnnnnn	重修琴学门径
Src29	ZTGnnnnn	怎样弹古琴
Src30	QBYnnnnn	琴学备要

The meanings of the residual columns are showed as below.

Column name	Meaning
Map	This entry is the direct pieces of evidence and usage for the corresponding fingering letter.
Unify	This entry should be unified to the corresponding fingering letter based on the usage. We will consider registering the unifiable glyphs to IVD in a new specifical IVS collection in future.
Merge	This entry is just merged to the corresponding fingering letter based on the usage. It is not suitable to encode separately or unify to any character, but some type designers could use the glyph in their fonts.
BSeq.	This entry should be showed by supporting as the sequence for the big-sized "character". See Section 3.2.2.
Merge2BSeq.	This entry is just merged to the corresponding big-sized "character" sequence. It is not suitable to be showed by supporting as the sequence, but some type designers could use the glyph in their fonts.
SSeq.+GSUB	This entry should be showed by supporting as the sequence for the small-sized "character" via the new GSUB feature. Also see Section 3.2.2.
Mer2SSeq.+GSUB	This entry is just merged to the corresponding small-sized "character" sequence via the new GSUB feature. It is not suitable to be showed by supporting as the default form of the sequence or other form via the new GSUB feature, but some type designers could use the glyph in their fonts.
OtherNote	See Section 3.2.3.

Appendix H *Evidence for other unencoded fingering letters*

This appendix is the supplement of the evidence for the unencoded fingering letters which are not included in Appendix G. See App H.pdf and App H.zip.

Appendix I *Technical statements in other public publications or materials*

This appendix is the supplement of Section 0.3. See App I.pdf.

Appendix J *Overview of Guqin Societies all over the World*
This appendix is also the supplement of Section 0.3. See `App J.pdf`.

Appendix K *Templates of pure Jianzi Musical Scores*
We use our working font to typeset two songs by the Jianzi Musical Notation without other musical notations and Han texts. See `App K.zip`.

Appendix L *Glimpse of encoding work activities*
This appendix shows our encoding work activities with some user communities and experts. See `App L.pdf`.

Appendix M *Simplified Chinese version of the complete lists of the contents*
This appendix can make it easier for Chinese readers to grasp the entire text. See `App M.pdf`.

(End of Document)

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html **.**
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Updated proposal on encoding Jianzi Musical Notation and format controls to UCS and Unicode*
2. Requester's name: *Culture and Art Publishing House, Eiso CHAN, Richard ZOU, Zhao LIU, et al*
3. Requester type (Member body/Liaison/Individual contribution): *Individual contribution*
4. Submission date: *2023-10-07*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *YES*
   (or) More information will be provided later:

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: *CJK Unified Ideographs Components Supplement, Ideographic Symbols and Punctuation*
2. Number of characters in proposal: *140*
3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary	X	B.1-Specialized (small collection)		B.2-Specialized (large collection)	
C-Major extinct		D-Attested extinct		E-Minor extinct	
F-Archaic Hieroglyphic or Ideographic				G-Obscure or questionable usage symbols	

4. 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 P&P document? *YES*
   b. Are the character shapes attached in a legible form suitable for review? *YES*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
   Eiso CHAN
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
   Zhao LIU, 45473877@qq.com; Eiso CHAN, eisoch@126.com
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *YES*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *YES*
7. 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*

8. 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 HTUhttp://www.unicode.orgUTH for such information on other scripts. Also see Unicode Character Database (Hhttp://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

[1] Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *YES*

   If YES explain *See Section 0.4.*

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? *CESI, Research Institute of Music of Chinese National Academy of Arts, Chinese Intangible Cultural Heritage Museum, some Guqin classrooms like Chunyin Shuwu, Lanyou Xuetang, Chinese Characters Repertoire Program, CMEX and other Guqin players/experts in China and US*

   If YES, available relevant documents: *See Appendix L.*

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

   Reference: *See Section 0.3 & Appendix J.*

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

   Reference: *See Section 0.*

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

   If YES, where? Reference: *See Section 0.*

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *NO*

   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)? *YES*

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, or could be confused with, 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? *YES*

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

    If YES, reference: *See Section 3.*

    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? *NO*

    If YES, reference:

12. Does the proposal contain characters with any special properties such as control function or similar semantics? *YES*

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

    See Sections 3.3, 3.4 & 3.5.

13. Does the proposal contain any Ideographic compatibility characters? *NO*

    If YES, are the equivalent corresponding unified ideographic characters identified?

    If YES, reference: