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

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Appendix: 1

1. Problems of Guqin Jianzi encoding in WG2-N5041[1]

In WG2-N5041, a method of encoding for characters of Guqin scores (be called Jianzi in WG2-N5041) was introduced. Guqin Jianzi originated in the Tang Dynasty and has been used up to now. However, the formation of glyph is so complicated. Characters of Jianzi have not be encoded.

We have read and analyzed the method in WG2-N5041 carefully. Encoding basic characters and format controls, then combine into clusters for the complex characters. We think this method accord with the characteristics of Jianzi. But we also think there are some problems in this method.

1.1 It is too complex to describe Jianzi by fixed structure

In WG2-N5041, Jianzi clusters (big-size) is described by 3 formats with specific structure. Any Jianzi cluster will be described by 1 of 3 formats. This method can describe most characters of Jianzi but too complex. It will introduce many problems.

1.1.1 There must be a layout table.

Because Guqin Jianzi have not be normalized, there are some different glyphs for same character in different books. In order to show these differences, there are 4 selectors (JIANZI LAYOUT SELECTOR) designed in WG2N5041. However, to describe different layouts by encoding, a layout selectors table outside of the encoding table must be used for mapping layouts and selectors. It will increase complexity of encoding system. For example:

 (Q-419726, *Yangchuntang GuQin Score,* 阳春堂琴谱) [2]

 (Q-321675, *Wuyin GuQin Score,* 五音琴谱) [2]

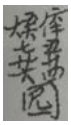
 (Q-465589, *Xinchuan Lixingyuanya,* 新传理性元雅) [2]

The above three characters have the same meaning. They are read as “Da Qi Ban Tiao Wu” (大七半挑五). It means “thumb of left hand presses marker seven and half, index finger of right hand plucks fifth string.” The layouts of the “Da Qi Ban” section are different. So selctor-layout mapping must be specified.

1.1.2 There may be some characters that cannot be described.

Because the Guqin Jianzi has not been normalized so far, there may be some characters for particular playing methods cannot be described by scheme in WG2N5041. In addition, as a widely used musical instrument nowadays, some new characters are created with new playing methods and skills. For example, the following two characters are not found in Appendix 3 of WG2-N5041. We don't know how to describe them.

 (Q-515316, *Tao's GuQin Score,* 陶氏琴谱)[2]

 (Z-1528, *New Sound of Guqin,* 古琴新声)[3]

1.1.3 Characters of the same type are described by different structures.

There are two examples given by Appendix 3 of WG2-N5041. The two characters are same type. But they are be described by different structures, due to the different number of components reduced. Some “ditto” messages in first

character  were lost because a simple structure be used.

 JZCC01 structure is used in Appendix 3 (P18, L4) of WG2-N5041. It means that there are only 5 components (include "ditto") in this character. The coding sequence is:

<U+1DAE4,U+1DAE2,U+1DAE2,U+1DAE2,U+1DB52,U+1DAF0,U+1DB29,U+1DAE1,U+1DB0E>

 JZCC02 structure is used in Appendix 3 (P81, L4) of WG2-N5041. It means that there are 11 components (include "ditto") in this character. The coding sequence is:

<U+1DAE5,U+1DAE2,U+1DAE2,U+1DAE2,U+1DAE2,U+1DB29,U+1DAE2,U+1DAE2,U+1DAE2,U+1DB23,U+1DB0E,U+1DB52,U+1DAF0>

1.1.4 For common Jianzi, a lot of redundant characters will be filled in.

The characters of Guqin Jianzi contain different parts. In Guqin Jianzi, when a component is same with previous characters, this component can be omitted. So the same finger method will be shown by different characters.

For fixed structure, fillers must be used to fill the structure. In WG2-N5041, there is a control character JIANZI DITTO FILLER be designed for the omitted component. In real Guqin score, most Jianzi needn't whole components of the fixed structure. Thus, there will be a lot of fillers be used in Guqin scores.

For example:

1) Having analyzed the Guqin music materials we collected, it is estimated that around 80% characters need fillers by scheme of WG2N5041. All top 20 highest frequently used characters of the 190,000 characters need fillers: 1 character needs 1 filler; 1 character needs 2 fillers; 14 characters need 3 fillers respectively; 4 characters need 4 fillers respectively. Totally more than 580,000 fillers are needed for the total 190,000 characters.
2) There are 1905 fillers in the Jianzi Sequences of the 1091 samples shown in Appendix 3 of WG2-N5041. Only 220 samples in the 1901 needn't filler.
3) The sample is Fig. 1.2.1 of WG2-N5041. All characters in the sample need more than 3 fillers.

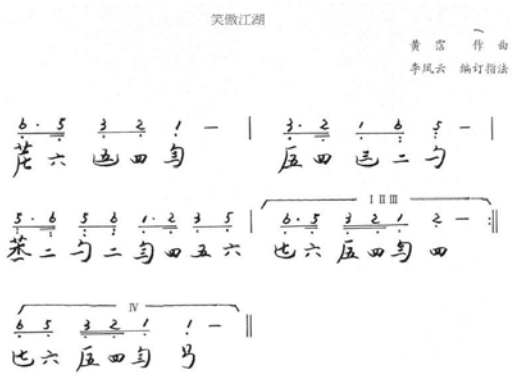


Fig. 1.1.4.1 Sample of Guqin score in WG2-N5041

1.2 It's hard to cover all Ideograph-like characters by encoding everyone.

There are some characters of Jianzi written like ideographs. But most of them are combinations of basic units. Such as  (QZ-590, TuiYin, 退吟) is combined by  (Z-407, Tui, 退) and (QZ-519, Yin, 吟). In WG2-N5041, each character of this type was given a code. This will cause some problems.

1.2.1 It will be difficult to cover all characters

In WG2-N5041, some common characters were encoded. But there are many common characters appearing in Guqin score books were not included. Such as  (Z-483, ManTan, 慢弹), (Z-488, LianTan, 连弹), (Z-588, yuanSuo, 圆锁) etc. There are a lot of these combinations. According to the development of Guqin playing techniques, new characters will appear. Such as (Z-829, LianSuo, 连锁) appeared in *New Sound of Guqin* (古琴新声). It will be difficult to cover all these combinations with this encoding method. Encoding system will be constantly updated.

1.2.2 The number of variants will be too large.

Because Guqin Jianzi haven't be normalized. Many characters have variant glyphs. There may be different glyphs for all basic units. The combination may be in different layout format. These different units can combine a lot of variants.

In *Integration of Guqin fingering notation* (古琴指法谱字集成), character YuanLou (圆搂) include 11 variants.[3] There are only 7 variation selectors were

designed in WG2-5041, it is not enough.

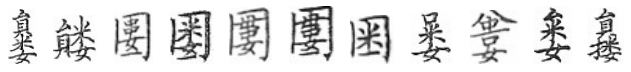


Fig 1.2.2.1 Variants of YuanLou in Integration of Guqin fingering notation

(Z-686 to Z-696, Integration of Guqin fingering notation, 古琴指法谱字集成)

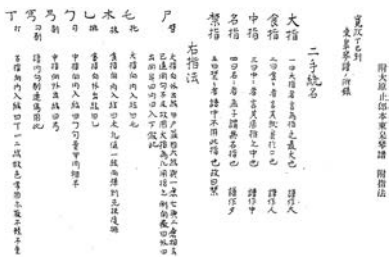
1.3 Ordering by number of strokes is not in conformity with practices

1.3.1 Ordering should be based on traditional habits.

There is a widely used practice for classification and ordering of Guqin Jianzi. Similar classification and ordering methods have been used in all materials (score, textbook and other about Guqin) we have found. The common classification methods have right hand fingering, left hand fingering, both left and right hands fingering, normal fingering, and so on.[2][4][5][6] Ordering should be based on traditional habits, or will cause more problems for users.

In WG2-N5041, Guqin Jianzi characters are sorted in number of strokes. In fact, most characters of Guqin Jianzi have many variants. It will be difficult to get the correct number of strokes without knowing the used glyph when characters are ordered in number of strokes.

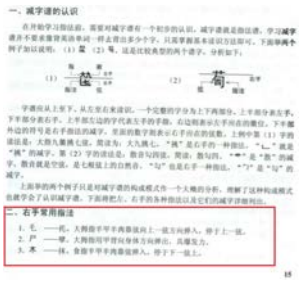
琴学心声谐谱[2]



东皋琴谱[2]

虞山吴氏琴谱[4]

古琴艺术的机器演绎[5]



古琴初级教程[6]

兰田馆琴谱[2]

Fig 1.3.1.1 Samples of Fingering Table

1.3.2 The problems proposed in WG2-N5041 can be solved.

There are 4 examples in WG2N5041 explaining why the traditional ordering method is not applied, but we think all problems in the samples are not insoluble.

1) Meanings of 尸(擘) and 乇(托) are interchanged in different books

Meanings of 尸(擘) and 乇(托) were interchanged in Qing Dynasty. But now, people in Guqin circles have same understand.

2) Different fingerings use same glyph

It is hard to recognize character  to fingering class left or right hand. Because it represents two different fingerings, a right hand fingering (换) and a left hand fingering (唤). This question can be solved by Guqin circles. There were solutions in some Guqin scores. For example: use different glyphs to represent, such as  and  (Qinxiangtang Guqin Scores, 琴香堂琴谱)[2].

3) Numerals are not listed in almost all the books

The numerals used for strings and markers are not listed in almost all the books, because all of them are used as glyph same to ideographs. Their meanings are very clear. They need not be described in fingerings table. Numerals are often included in modern books, and are classified in normal characters.

虞山吴氏琴谱[4]

古琴艺术的机器演绎[5]

Fig 1.3.2.1 Samples of Numerals in Fingering Table

4) Some Jianzi musical symbols can be used as both of fingering letters and numerals

There are some Jianzi characters that every character has two or more meanings used in Guqin scores. We think that can be solved by adding a note only.

1.4 Many characters are not collected.

There are 336 basic components and ideograph-like characters have been collected in WG2-N5041. However, we have found more than 700 characters only in partical materials of *Integration Guqin scores.*[2] A lot of different characters were not be collected in WG2-N5041. For example：

 (QZ-473，ShuangGou，双勾),  (QZ-39, TiaoDa，挑打),

 (QZ-52，LianZhai，连摘),  (QZ-21, LiBo，历擘).

See appendix 1 for details.

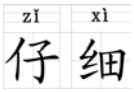
1.5 Small-sized Cluster is layout format, needn't encoding.

A small-sized control was designed in WG2-N5041 (3.3.6), for processing small-sized cluster - a special format in Guqin score.

Fig 1.5.1 Sample of Small-size Cluster

We think small-sized cluster is a special layout format. Both reading and meaning of small-sized cluster are consistent with the content that is not combined into

small-sized cluster. It can be implemented by application and need not be encoded as characters. Such as to process PinYin (Chinese spelling) on ideographs, or upper and lower subscript.

A^2 (upper subscript), A_2 (lower subscript), 

(PinYin)

Fig 1.5.2 Sample of PinYin and Subscript

1.6 Other questions.

1.6.1 廿 (san, 散) should be considered left hand fingering

In many ancient Guqin scores, 廿(san, 散) is classified as right hand fingering. It means playing string(s) with right hand and not pressing any string with left hand. In fact, it is a rule for left hand that means "the left hand does not press any string". 廿 can be combined with all right hand fingerings, but cannot be combined with any left hand fingering. If 廿 is classified as right hand fingering, there will be a lot of combination of right hand fingering. Such as:[2][3]

 (Z-205, SanDa, 散打),  (QZ-1132, SanYi, 散抑),

 (QZ-1212, SanRu, 散如),  (QZ-5035, SanZhai, 散摘),

 (QZ-132, SanJuan, 散蠲),  (QZ-429, SanJianGou, 散间勾).

If 廿 is classified as left hand fingering, these fingerings will become normal, means right hand playing and left hand free. In many new materials, 廿 is classified as normal character without left or right hand.[3][4][6] We think 廿 should be classified as left hand fingering. Because 廿 is a rule of left hand, and mutual exclusion with all left hand fingerings. If 廿 is classified as left hand fingering, it will become easy to process about 廿. There is a sample in ancient Guqin scores that 廿 is classified as left fingering - *Siqitang Guqin Scores* (思齐堂琴谱). So we suggest to classify 廿 as left hand fingering.

In WG2-N5041, 廿 is classified as right hand fingering. The sample in Appendix 3, 廿 and other right hand fingering to be combined by JOINER. For example:

 (San Tiao Liu Xian, 散挑六弦, WG2-N5041, Appendix 3, P10, L12)

The Jianzi sequence given in Appendix 3 of WG2-N5041 is:

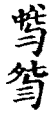
<U+1DAE4,U+1DAE2,U+1DAE2,U+1DAE2,U+1DB23,U+1DAE0,U+1DB01, U+1DB29>

If 艹 is classified as left hand fingering, the Jianzi sequence will be easy:

<U+1DAE4, U+1DB23,U+1DAE2,U+1DAE2, U+1DB01,U+1DB29>

1.6.2 Name of filler (DITTO) is inaccurate

There is a filler control symbol in WG2-N5041, be used to fill the Jianzi structure, when the components is less than the asked number of structure. The symbol is named JIANZI DITTO FILLER. But not all environments used for this character are DITTO. For example:



(*Shenqi Secret Score,* 神奇秘谱, ZHXHP000001-000162-1)

The two characters is “Zhong Ba Qi Gou Er” (中八七勾二) “and Ming Qi Gou San” (名七勾三). According to the definition of structure in WG2-N5041, both of them are structure JZCC01. There will be 5 components following JZCC01. But the second character has only 4 components, so a FILLER is needed after Ming qi (名七) to fill sub-marker. Fig. 1.6.1 show the sequences of the two characters.

Fig1.6.1 Sample for Sequences about DITTO

The second character is left hand press marker 7, no sub-marker. If JDFZ means ditto, it means that the same sub-marker 7 as the previous character has been omitted. The result of second character will become to “Ming Qi Qi Gou San” (名七七勾三). This by-default interpretation is obviously wrong.

1.6.3 Picture error

Figure 1.1.2 in WG2-N5041, the title is "Guqin", the music instrument in the picture is not Guqin, it is Zheng (箏).

Gu-Qin: 7 Strings, No Pillar. Gu-Zheng: More strings, Goose Pillars(雁柱)

Fig1.6.3.1 Pictures of Guqin and GuZheng

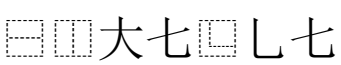
2. Suggested Solutions

2.1 A Method for Jianzi Encoding with Unfixed Structure.

2.1.1 Introduction of the Method for Jianzi Encoding with Unfixed Structure

A method to describe structure of characters of Guqin Jianzi by XML was proposed in reference [7]. Based on this method,characters of Guqin Jianzi are combined as structures same to ideographs, characters of Guqin Jianzi can be described as Ideographic Description Sequence (IDS). For example:

 (Da Qi Tiao Qi, 大七挑七),

will be described as： 

The advantage of this method is that it can describe all characters of Guqin Jianzi in a simple and clear format. All we need to do is to define the basic components and rules of combination. There is no need to specify anything else. For example, JIANZI LAYOUT SELECTOR will be not need. For innovation of fingerings, this method can describe without adding new control symbols. In addition, sequence of components in this method is same to reading and meaning sequence of Guqin Jianzi characters. It is easy to understand, retrieve and input. We suggest to encoding Guqin Jianzi with this method.

2.1.2 Control Symbols of Unfixed Structure

1) Control symbols of unfixed structure include most of Ideographic Description Characters

Control symbols of unfixed structure include 11 of the existing 12 IDCs.

□□□□□□□□□□□□□

The overlapping-structure symbol is not selected for avoding ambiguous structural meanings.

□

2) New symbols for common structure.

□□

□ - a common structure of left hand fingering:

For example: will be describe as □□大五半□勹五

□ - a class of structures, such as 早(Cuo, 撮):

For example: will be describe as □早一六

2.1.3 The problems of fixed structure can be solved by this method

1) JIANZI LAYOUT SELECTOR will be need not.

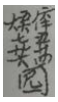
 (Q-419726): □□大七半□乚五

 (Q-321675): □□大七半□乚五

 (Q-465589): □□大□七半□乚五

2) Ability to describe complex characters.

 (Q-515316): □乃□五□□女五□廿六

 (Z-1528): □□□□□大五六七□廿六□□□亻六半五□廿四□口□尸乚

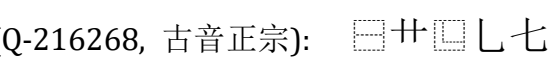
3) Characters of same type are described by same structural symbol.

 (WG2-N5041-P18, L4): □早六三

 (WG2-N5041-P81, L4): □早六□廿三

4) Common characters is simple, need not fillers.

 (Q-15871, 西麓堂琴统): □勹四

 (Q-216268, 古音正宗): 

In our characters database (collected from *Integration of Guqin scores,* 琴曲集成),  has 13133 samples, is the most. has 9752 samples, is no. 9.

2.1.4 Comparison between fixed and unfixed structure methods.

Unfixed structure encoding methods describe characters simpler and clearer. It need not tables about control and layout selector. For code sequence size, in unfixed structure method, there are more codes are required for complex characters, and there are less codes for simple characters. In fixed structure method (WG2-N5041), for complex characters, it maybe use codes less than unfixed structure method. But for simple characters, it must use more codes to fill the fixed structure. In practical Guqin scores, the most characters are simple. If simple characters being described with few codes, total size of Guqin scores will be small, and the score will be easy to understand. For complex characters, frequency of use is very low, it doesn't matter much even a character need more codes.

2.2 Use combination to describe ideograph- like cluster.

There is a method of encoding to Guqin ideograph-like characters was introduced in reference [5]. In this method, only basic components will be encoded, other characters will be combined by basic components, even ideograph-like characters.

This method not only can reduce number of encoding characters, but also can cover almost all characters of Guqin Jianzi. It will improve the stability of encoding system. We suggest use this method.

In fact, components of Guqin Jianzi are different to components of ideographs. If some components combine to an ideograph character, the new character will have new pronunciation and meaning. If some components combine to a character of Guqin Jianzi, the new character will be read as the sequence of components, and its meaning is combination of all components. Characters of Guqin Jianzi should be described by basic components. For example:

 Describe as  ,

It is combined by 艮(Tui, 退) and 亍(Yin, 吟). It is read Tui Yin (退吟), and it's meaning is to play as combination of 艮(Tui, 退) and 亍(Yin, 吟).

In the 336 characters in WG2-5041, 艮 was not encoded, but was used 15 times in other combinations. 亍 was encoded as U+1DBF0, and was used 39 times in other combinations. Consider encoding all basic components: all 336 characters in WG2-5041 could be covered by 185 basic components; or 254 basic components to cover all 717 characters (336 in WG2N5041, 381 in WG2N5041Appendix 1).

2.3 Unfixed Structure Method is an available solution.

With this method, both cluster characters and ideograph-like characters can be processed with unified rules.

The rules are simple and easy to understand. It is an available solution for Guqin Jianzi encoding.

3. Some Issues

3.1 Characters of Guqin Jianzi Should be Normalized.

Many Guqin score books provide one fingering letter tables. But Guqin Jianzi has not been standardized. There are many remaining problems because non-standard and non-uniform. Such as one character is described by more different glyphs and one glyph is used to represent several different characters.

Before encoding, existing characters of Guqin Jianzi should be standardized by most experts in Guqin circles. We should have an accurate and clear characters set as the foundation of encoding. In addition, variants can be used to describe the different glyphs.

3.2 The rules of new fingering characters should be formulated

Guqin is a widely used music instrument. With the development of playing skills, there will be some new playing method to be innovated. For example, some innovative characters was include in *Integration of Guqin fingering notation* (古琴指法谱字集成). If there is no standard for new fingering characters, these innovative characters will be arbitrary written. Encoding to these characters will

become difficult. We need rules for innovative fingering characters. The new fingering should be described by encoded components and control symbols as far as possible, avoid code set will be updated frequent.

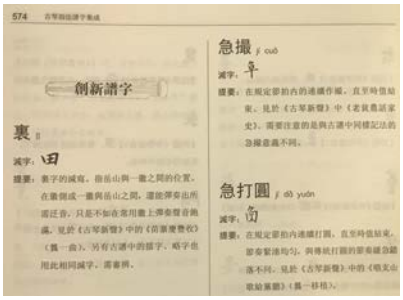


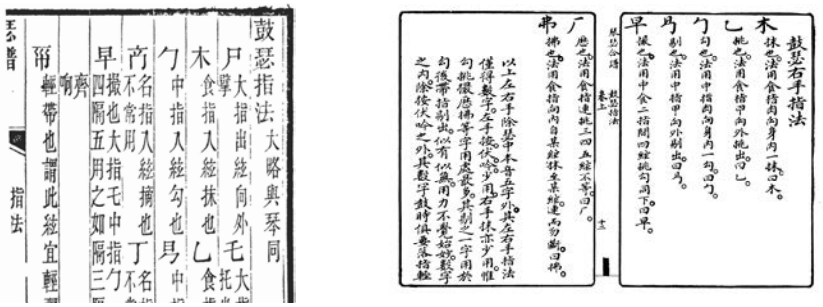
Fig. 3.2.1 Innovative Characters [3]

3.3 Research characters of similar music instrument scores

Se (瑟) is a kind of ancient music instrument too. Playing method of Se is similar to Guqin. There are some other music instruments use similar playing method. Most characters of scores for these music instruments are same to Guqin Jianzi. But it also has its own characteristics. For example:

Fig. 3.3.1 Characters of Se [2]

Encoding for these characters should be considered in a unified way.



Scores of Se，拟瑟谱　　Combining Scores of Guqin and Se，琴瑟合谱[2]

Fig. 3.3.2 Samples of Se Scores

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Description for the Source of Samples

Q —— Database of Integration Guqin scores (琴曲集成-资料库)

QZ —— Fingering tables in Integration Guqin scores (琴曲集成-指法表)

Z —— Integration of Guqin fingering notation (古琴指法谱字集成)

Appendix 1. Characters Un-included in WG2-N5041

ID	Glyph	Name
QZ-1358		各 ge
QZ-1417		定 ding
QZ-1376		指 zhi
QZ-5030		中按 zhong an
QZ-1074		跪按 gui an
QZ-1073		并按 bing an
QZ-1077		双按 shuang an
QZ-1147		撾（撻） e
QZ-1072		屈按 qu an
QZ-1396		落 luo
QZ-1430		落指 luo zhi
QZ-472		并 bing
QZ-1255		慢 man
QZ-1271		又慢 you man
QZ-1317		徐 xu
QZ-1318		徐作 xu zuo
QZ-362		急连 ji lian
QZ-1306		复急 fu ji
QZ-1360		另 ling

ID	Glyph	Name
QZ-404		无 wu
QZ-273		无声 wu sheng
QZ-1205		随声 sui sheng
QZ-1201		合声 he sheng
QZ-1212		散如 san ru
QZ-5031		从 cong
QZ-1322		作 xuo
QZ-1525		加 jia
QZ-1422		次 ci
QZ-1293		应息 ying xi
QZ-1294		忍 ren
QZ-1418		微 wei
QZ-1156		近 jin
QZ-1160		远 yuan
QZ-1427		略 lve
QZ-1425		斜 xie
QZ-1227		得 de
QZ-5033		句 jv
QZ-918		起 qi

ID	Glyph	Name
QZ-1416		对 dui
QZ-1400		带 dai
QZ-1407		飞 fei
QZ-1200		觔节 jin jie
QZ-1526		软 ruan
QZ-433		逐 zhu
QZ-1248		收 shou
QZ-1235		入杀 ru sha
QZ-1356		变 bian
QZ-1374		尾 wei
QZ-1194		附弦 fu xian
QZ-1350		终 zhong
QZ-1148		闼 ta
QZ-457		擽 li
QZ-1249		么 me
QZ-458		捋 lv
QZ-459		摽 biao
QZ-473		双勾 shuang gou
QZ-460		撩 liao
QZ-40		打挑 da tiao

ID	Glyph	Name
QZ-39		挑打 tiao da
QZ-41		勾打 gou da
QZ-46		双打 shuang da
QZ-44		弹打 tan da
QZ-454		覆打 fu da
QZ-465		撒 sa
QZ-5035		散摘 san zhai
QZ-1524		摘至 zhai zhi
QZ-51		节摘 jie zhai
QZ-52		连摘 lian zhai
QZ-466		捌 lie
QZ-363		捻 nian
QZ-453		拈 nian
QZ-60		疾历 ji li
QZ-55		急历 ji li
QZ-61		缓历 huan li
QZ-56		双历 shuang li
QZ-59		摘历 zhai li
QZ-21		历擗 li pi(bo)
QZ-62		拂历 fu li

ID	Glyph	Name
QZ-194		倒半轮 dao ban lun
QZ-189		背轮 bei lun
QZ-324		弹/单弹 tan/dan tan
QZ-344		二弹 er tan
QZ-343		慢弹 man tan
QZ-345		急弹 ji tan
QZ-341		连弹 lian tan
QZ-342		齐弹 qi tan
QZ-227		复圆 fu yuan
QZ-259		双拨刺 shuang bo la
QZ-260		双弹拨刺 shuang tan bo la
QZ-356		缓龊 huan chuo
QZ-350		反龊 fan chuo
QZ-351		背龊 bei chuo
QZ-172		打锁 da suo
QZ-154		一锁 yi suo
QZ-5037		急锁 ji suo
QZ-173		缓锁 huan suo
QZ-169		圆锁 yuan suo

ID	Glyph	Name
QZ-1413		叠 die
QZ-448		叠指 die zhi
QZ-132		散蠲 san juan
QZ-119		倚涓 yi juan
QZ-115		慢涓 man juan
QZ-114		急涓 ji juan
QZ-140		单蠲 dan juan
QZ-138		散连蠲 san lian juan
QZ-108		累涓 lei juan
QZ-110		双涓 shuang juan
QZ-104		分涓 fen juan
QZ-141		正蠲 zheng juan
QZ-116		拨刺涓 bo la juan
QZ-379		牵 qian
QZ-380		双牵 shuang qian
QZ-381		疾牵 ji qian
QZ-382		缓牵 huan qian
QZ-383		牵挑 qian tiao
QZ-195		扶 fu

ID	Glyph	Name
QZ-209		半挑扶 ban tiao fu
QZ-198		缓全扶 huan quan fu
QZ-208		缓半扶 huan ban fu
QZ-197		疾全扶 ji quan fu
QZ-199		节全扶 jie quan fu
QZ-455		搂 lou
QZ-226		缓圆搂 huan yuan lou
QZ-430		逆间勾 ni jian gou
QZ-426		反间勾 fan jian gou
QZ-424		覆间勾 fu jian gou
QZ-427		缓间勾 huan jian gou
QZ-432		挑间勾 tiao jian gou
QZ-425		拙间勾 zhuo jian gou
QZ-429		散间勾 san jian gou
QZ-431		展转间勾 zhan zhuan jian gou
QZ-474		指转 zhi zhuan
QZ-400		截竹声 jie zhu sheng
QZ-443		截刺 jie la
QZ-391		拨杀 bo sha

ID	Glyph	Name
QZ-403		裂帛声 lie bo sheng
QZ-387		断 duan
QZ-5034		折竹声 zhe zhu sheng
QZ-396		扫 sao
QZ-397		反扫 fan sao
QZ-386		叶 ye
QZ-385		挫 cuo
QZ-471		度弦声 du xian sheng
QZ-22		摘擗 zhai pi(bo)
QZ-5001		摘历擗 zhai li pi(bo)
QZ-354		摘历擗龊 zhai li pi(bo) chuo
QZ-23		摘历龊擗 zhai li chou pi(bo)
QZ-1081		疾上 ji shang
QZ-1149		硬 ying
QZ-816		进 jin
QZ-1086		许 hu
QZ-1093		虚浒 xu hu
QZ-1057		二引 er yin
QZ-1083		疾下 ji xia

ID	Glyph	Name
QZ-1225		退下 tui xia
QZ-1085		上下 shang xia
QZ-817		退 tui
QZ-818		硬退 ying tui
QZ-1232		滑 hua
QZ-821		复 fu
QZ-832		双进复 shuang jin fu
QZ-833		虚进复 xu jin fu
QZ-834		小虚进复 xiao xu jin fu
QZ-851		双退复 shuang tui fu
QZ-493		大绰 da chuo
QZ-502		复绰 fu chuo
QZ-492		三绰 san chuo
QZ-497		远绰 yuan chuo
QZ-495		飞绰 fei chuo
QZ-1174		绰挹 chou yi
QZ-499		急绰 ji chuo
QZ-500		缓绰 huan chuo
QZ-1129		抑 yi

ID	Glyph	Name
QZ-1131		绰抑 chuo yi
QZ-516		绰注 chuo zhu
QZ-511		双注 shuang zhu
QZ-513		远注 yuan zhu
QZ-508		飞注 fei zhu
QZ-510		虚注 xu zhu
QZ-319		度绰 du chuo
QZ-788		次撞 ci zhuang
QZ-810		退撞 tui zhuang
QZ-786		走撞 zou zhuang
QZ-785		对撞 dui zhuang
QZ-804		小虚撞 xiao xu zhuang
QZ-813		退复撞 tui fu zhuang
QZ-795		急双撞 ji shuang zhuang
QZ-798		缓撞 huan zhuang
QZ-796		慢撞 man zhuang
QZ-797		慢双撞 man shuang zhuang
QZ-672		大实吟 da shi yin
QZ-671		急实吟 ji shi yin

ID	Glyph	Name
QZ-641		微吟 wei yin
QZ-659		藏吟 cang yin
QZ-675		双注吟 shuang zhu yin
QZ-630		撞吟 zhuang yin
QZ-664		入吟 tu yin
QZ-667		就吟 jiu yin
QZ-1424		苦 ku
QZ-668		苦吟 ku yin
QZ-679		复吟 fu yin
QZ-657		推吟 tui yin
QZ-660		虚吟 xu yin
QZ-673		急双吟 ji shuang yin
QZ-670		慢吟 man yin
QZ-674		慢双吟 man shuang yin
QZ-1145		臑 nao
QZ-732		放猱 fang nao
QZ-733		圆猱 yuan nao
QZ-719		走猱 zou nao
QZ-742		陡猱 dou nao

ID	Glyph	Name
QZ-737		蓄猱 xu nao
QZ-761		回猱 hui nao
QZ-770		慢双猱 man shuang nao
QZ-769		急双猱 ji shuang nao
QZ-767		急大猱 ji da nao
QZ-768		慢大猱 man da nao
QZ-771		急撞猱 ji zhuang nao
QZ-775		入猱 ru nao
QZ-776		出猱 chu nao
QZ-744		虚猱 xu nao
QZ-869		使 shi nao
QZ-863		注逗 zhu dou
QZ-1092		软逗 ruan dou
QZ-868		迎 ying
QZ-676		唤吟 huan yin
QZ-1228		荡 dang
QZ-1146		荡指 dang zhi
QZ-1353		走 zou
QZ-1170		遒起 yu qi

ID	Glyph	Name
QZ-461		撇 pie
QZ-1246		押 ya
QZ-968		推起 tui qi
QZ-1133		兜（挽） dou
QZ-1173		挹 yi
QZ-902		注掩 zhu yan
QZ-905		连掩 lian yan
QZ-1183		掩摺 yan qia(tao)
QZ-909		点 dian
QZ-984		虚点起 xu dian qi
QZ-989		抓 zhua
QZ-986		虚兜起 xu dou qi
QZ-987		虚勾起 xu gou qi
QZ-979		虚起 xu qi
QZ-960		撞带起 zhuang dai qi
QZ-958		摺带起 qia(tao) dai qi
QZ-959		注摺带起 zhu qia(tao) dai qi
QZ-967		爬起 pa qi
QZ-977		斡起 wo qi

ID	Glyph	Name
QZ-988		拾起 shi qi
QZ-926		虚摺起 xi qia(tao) qi
QZ-1182		三摺 san qia(tao)
QZ-924		反摺起 fan qia(tao) qi
QZ-1210		过 guo
QZ-937		注对起 zhu dui qi
QZ-944		楱摺起 zan qia(tao) qi
QZ-946		背楱起 bei zan qi
QZ-1426		遊 you
QZ-1245		括 kuo
QZ-1190		研余 yan yu
QZ-1361		竖 shu
QZ-1204		掾(□扌豕) zhuo
QZ-1153		捺 na
QZ-1095		吼 hou
QZ-1046		互泛 hu fan
QZ-1044		牙泛 ya fan
QZ-1079		泛按 fan an
QZ-188		双轮 shuang lun

ID	Glyph	Name
QZ-186		索轮 suo lun
QZ-235		注索铃 zhu suo ling
QZ-1023		绰合 chuo he
QZ-1029		起合 qi he
QZ-1018		爬合 pa he
QZ-1016		撇合 pie he
QZ-1049		虚泛 xu fan
QZ-70		摇拂历三声 qia(tao) fu li san sheng
QZ-298		摇撮 qia(tao) cuo
QZ-304		摇撮四声 qia(tao) cuo si sheng
QZ-308		摇撮五声 qia(tao) cuo wu sheng
QZ-250		摇拨剌 qia(tao) bo la
QZ-257		摇拨剌五声 qia(tao) bo la wu sheng
QZ-1355		剔如散 ti ru san
QZ-268		剌按散 la an san
QZ-264		拨按散 bo an san
QZ-1202		拽搦 zhuo nuo
QZ-1203		啄搦声 zhuo nuo sheng
QZ-978		勾起 gou qi

ID	Glyph	Name
QZ-1175		屈大 qu da
QZ-1176		屈食 qu shi
QZ-1177		屈名 qu ming
QZ-33		急勾 ji gou
QZ-42		散打 san da
QZ-43		缓打 huan da
QZ-352		勾龊 gou chuo
QZ-353		擘龊 pi(bo) chuo
QZ-355		龊挑 chuo tiao
QZ-357		打龊 da chuo
QZ-174		醉锁 zui suo
QZ-117		醉涓 zui juan
QZ-113		短涓 duan juan
QZ-118		长涓 chang juan
QZ-200		蠲扶 juan fu
QZ-447		却轮指 que lun zhi
QZ-187		走轮 zou lun
QZ-1132		散抑 san yi
QZ-1195		绰搦 chuo nuo

ID	Glyph	Name
QZ-1048		前后泛 qian hou fan
QZ-778		通獳 tong nou
QZ-1181		挹摇 yi qian(tao)
QZ-1189		食勾 shi gou
QZ-1196		折腰敦 zhe yao dun
QZ-1197		藏头敦 can tou dun
QZ-469		绰声 chuo sheng
QZ-1199		节 jie
QZ-1529		五度蠲 wu du juan
QZ-112		摘打涓 zhai da juan
QZ-107		绰涓 chuo juan
QZ-1507		食中名抹勾打五 shi zhong ming mo gou da wu
QZ-77		拨拂 bo fu
QZ-26		托起 tuo qi
QZ-47		历打 li da
QZ-109		细涓 xi juan
QZ-272		按伏 an fu
QZ-289		大反撮 da fan cuo
QZ-428		擗轮间勾 pi(bo) lun jian gou

ID	Glyph	Name
QZ-512		对注 dui zhu
QZ-518		按注 an zhu
QZ-614		撞遊吟 zhuang you yin
QZ-654		活吟 huo yin
QZ-655		放吟 fang yin
QZ-656		紧吟 jin yin
QZ-666		分吟 fen yin
QZ-756		飘猱 piao nao
QZ-757		寔猱 shi nao
QZ-758		半猱 ban nao
QZ-759		徽猱 hui nao
QZ-903		急掩 ji yan
QZ-906		连掩带 lian yan dai
QZ-939		跪对起 gui dui qi
QZ-1024		正合 zheng he
QZ-1027		远合 yuan he
QZ-1028		息合 xi he
QZ-1050		爪泛 zhua fan
QZ-1076		单按 dan an

ID	Glyph	Name
QZ-1078		三按 san an
QZ-1091		小浒 xiao hu
QZ-1169		大掉 da diao
QZ-1209		斡 wo
QZ-1213		按弦 an xian
QZ-1224		双绰放 shuang chuo fang
QZ-1236		进音 jin yin
QZ-1237		退音 tui yin
QZ-1239		放下 fang xia
QZ-1240		对勾 dui gou
QZ-1241		推放 tui fang
QZ-1242		带放 dai fang
QZ-1243		点下 dian xia
QZ-1244		中下 zhong xia
QZ-1247		传 chuan
QZ-1272		慢作 man zuo
QZ-1305		皆急 jie ji
QZ-1321		再 zai
QZ-1397		累 lei

ID	Glyph	Name
QZ-1409		细飞 xi fei
QZ-1410		飞上 fei shang
QZ-1411		飞下 fei xia
QZ-1412		止 zhi
QZ-1414		背 bei
QZ-1415		细 xi
QZ-1517		过弦 guo xian
QZ-1523		对趱 dui zan
QZ-5018		序终 xu zhong
QZ-5002		大序终 da xu zhong
QZ-5017		小序终 xiao xu zhong
QZ-5007		乱声终 luan sheng zhong
QZ-5024		吟终 yin zhong
QZ-5027		引终 yin zhong
QZ-5028		正声终 zheng sheng zhong
QZ-791		倒撞 dao zhuang
QZ-792		飞撞 fei zhuang
QZ-809		进撞 jin zhuang