Volume 2, Chapter 4: The Heavenly Canopy Is Made Round[1]

The top of the ch'in resembles the body of heaven as a canopy. The shoulders of the ch'in in front[2] are broad. In back[3] the waist is narrow. On the left and right the surface is oblique and rounded. Everywhere no matter whether it is rounded or straight, one should follow the set rules. The fingering all depends on this. So if one follows the rules of measurement, then the work should be true; otherwise, the fingering will not be true and the defects of resistance[4] and striking[5] will occur. The notes will lose their clarity and dampened sounds will result. The secret for a ch'in with an excellent surface lies in making the path of the strings suitable and in making the fingering convenient and easy. The nature of the strings is that they are straight, so every string route up and down the ch'in should likewise be straight and there should not be any defects of slight curvature or sunken places. The route should be suited to the strings. When the ch'in surface lines up with the strings, then the fingering will be close to the surface and will be naturally easy and smooth. The problems of resistance and too much expenditure of energy will not occur.

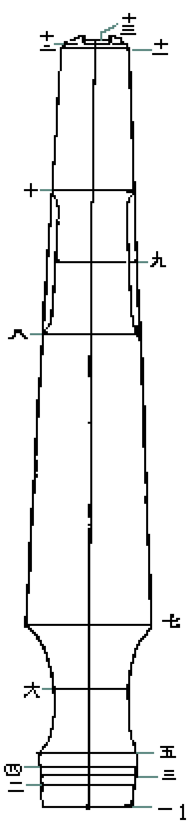


Figure 1 Ch'in top

The method involves first taking a piece of wood that is three feet, nine inches long. *[Three times three equals nine is the meaning.]*[6] It should be 9/10's of an inch thick and six inches wide. (The measurements) should exceed and not be less than this. It must follow Yin and Yang, and up and down; that is, take the face to be Yang and the head to be down.[7] *[The belly is Yin and the tail is up.]* The two broad faces should be planed flat, and right in the center of the planed area, draw a straight black line. This will be the base line. The measurements for the entire body will be marked off from this line. Now one should measure off every demarcation using a T-

[1]This chapter is about how to construct the top of the ch'in; that is, the "heavenly canopy". In ch'in lore, the top of the ch'in is "heaven", as heaven is round. The bottom is "earth" and square.

[2]Near the bridge.

[3]Near to the nut.

[4] This refers to the strings being too far from the face so they are hard for the fingers to press down.

[5] "Striking" here refers to the strings being too close to the surface by the bridge and so the fingers of the right hand strike the face.

[6] Some kind of numerology?

[7] Imagine a ch'in that is vertical, with the nut "up" and the bridge "down". See Figure 1. Note the vertical center line,and the 13 horizontal lines, with number 1 at the bottom, bridge end, and number 13 at the top, nut end. I have added an Arabic numeral 1 at the bottom to show where the first line is for those who do not read Chinese. The form of this ch'in is the conventional form, known as Chung-ni (仲尼). See Van Gulik, p. 191 for more information. Note that the author includes pictures of additional forms at the end of this section.

square to mark off crosswise, placing the T-square on the base line and marking off the places so the crosswise lines will be straight without any deviation. To begin, pick a place on the material to be the head end and draw a crosswise line there. *[This is crosswise line number one.]* It must be even. Then from this (line) divide and measure off two inches for the forehead (e 額). *[This is the second crosswise line.]* Draw another line 4/10's of an inch down for the cheng-lu (承露) (literally "receive-dew"). *[This is the third crosswise line.]* Mark off 3/10's inch for the bridge. *[This is the fourth crosswise line.]*

Mark another 8/10's inch for the ch'i-hsiang (起項) (beginning of the nape). *[This is the fifth crosswise line.]* Now mark off three and 2/10's inches for the center of the ching (頸) (neck). *[This is the sixth crosswise line. -* Again mark off three and 2/10's inches for the chien (肩) (shoulders). *[This is the seventh crosswise line.]* From the inside of the bridge to here makes seven and 2/10's inches all together, or one fifth of the total string length, and this is at the position of the fifth hui. Again from the shoulders measure off one foot, four and 4/10's inches for the start of the yao (腰) (waist). *[This is the eighth crosswise line.]* Measure three and 6/10's inches to the center of the waist. *[This is the ninth crosswise line.]* Measure off three and 6/10's inches to the end of the waist. *[This is the tenth crosswise line.]* From within the bridge to the start of the waist is two feet, one and 6/10's inches in all, and equals three fifth's of the string length, and this is at the eighth hui position. From within the bridge to the end of the waist measures two feet, eight and 8/10's inches, equals four fifth's of the string length, and is at the eleventh hui position. Now from the end of the waist measure off six and 2/10's inches for the kuan-chueh (冠角) (cap). *[This is the eleventh crosswise line.]* Measure off one inch for the tail end (尾末). *[This is the twelfth crosswise line.]* From within the bridge to here, altogether, is equal to three feet, six inches, and this is equal to the complete string measurement (for the top). Within the position of the nut (龍齦) (literally: "dragon's gums"), measure off 3/10's of an inch for the yin-k'ou (齦口) (literally: "gum's mouth" or nut's mouth). *[This is the thirteenth crosswise line.]* The face of the ch'in from the head to the tail then equals three feet, nine inches altogether in length. Also altogether there are twelve divided areas and thirteen crosswise lines.[8] Wherever one measures, measure according to the standard. *[Measuring from the base line makes it standard.]*

Now at the areas of successive separation, *[that is, the twelve areas.]* in all cases starting from the base line, measure to the left and right, drawing out straight lines to the two sides. These successive separated areas have their differences in width, and in the straightness of each interconnected section. For example, the nape and shoulder are connected and have a curved form. Beginning from the forehead, both on the left and right, mark off two and 3/10's inches. *[Altogether equal to four and 6/10's inches.]* At the beginning of the nape mark off, both on the left and right, two and a half inches. *[Altogether equal to five inches.]* Connect these places on both sides with a slanted line. *[On both sides, left and right, from the first and fifth crosswise lines, draw in a connecting slanted line.]* Again in the center of the neck measure off lines with lengths of two and

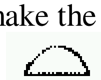
[8] See Figure 1.

3/10's inches. *[Altogether equal to four and 6/10's inches.]* Above from the beginning of the nape, *[Which on the left and right is measured to be two and 5/10's inches each.]* and below down to the shoulders, where on both sides one should measure out (from the base line) three inches. *[Altogether equal to six inches.]* Both areas should be connected by a curved and bowed line. *[Connect the bowed lines from the fifth to the seventh crosswise lines on both sides.]* Now at the cap on both left and right, measure off two inches, *[altogether equal to four inches.]* and to the shoulder, *[on the left and right at the two, three inch places.]* now draw in two long, straight, connecting lines. *[That is, draw the lines connecting the eleventh crosswise line to the seventh crosswise line.]* Now at the center of the waist on the right and left, up to the start of the waist and down to the end of the waist, and from within the long and oblique straight lines, *[that is, the lines on both sides from the cap to the shoulders.]* on both sides go in 15/100's of an inch, and then link these lines up to make parallel, straight lines.[9] *[Above and below, in all cases one should go in (from the outside line) 15/100's of an inch, so these are called parallel, straight lines.]* At the beginning and end of the waist one should draw these lines so as to slightly "turn the corner". Now at the nut mouth, draw out to both sides lines measuring 6/10's of an inch. *[Altogether equal to one and 2/10's inches.]* Link the ends of these lines up with the ends of the cap's lines in order to form crescent moon shaped lines. *[That is, link up the thirteenth and twelfth crosswise lines making crescent moon shaped lines.]* These then are all the lines on both sides, right and left, of the ch'in's face.

Once more draw lines from the base line to the sides, this time at the nut mouth, making each line 55/100's of an inch long. *[Altogether equal to one and 1/10's inches.]* At the ch'eng-lu draw lines measuring two inches in length. *[Altogether equal to four inches in length.]* Connect these lines up on both sides making straight lines. These lines are borders for the one and seven string positions.

So then all the lines for all the sections of the head and tail have been drawn out clearly. *[For the long, straight lines, use the carpenter's line method. The short curved lines are drawn free hand.]* So now according to the set form, front and back, left and right, saw out the complete ch'in face.

Now on the sides on both left and right, *[that is, the two, 9/10's of an inch thick (side) faces.]* from the tail to the shoulders, separated from the side of the face 65/100's of an inch, draw a parallel straight line. Then take the line and extend it; that is, draw it in by the three regions of the neck, bridge, and forehead, keeping it down accordingly along the side always. Now take the crosswise lines used previously to zone off sections, *[that is, the thirteen sectional crosswise lines.]* and one by one accordingly draw them vertically down onto the sides. Thus both sides then will be sectioned off.[10]

Now that the measurements for the entire body have been completed and the form cut, one should make the "overturned" form.[11] There are two kinds of forms. One is the bulging form  ; and the other form  descends less steeply. These are not the same. It depends on the design one wants to use. But the entirety, front and back,

[9] The curvature in the waist area is less than in the shoulder area.
[10] The face will be planed down to these 65/100's lines, thus making the curved top.
[11] Here the text begins to discuss how to create the curvature of the face.

above and below, must match, so that the string path will be suitable and the fingering will consequently be without resistance. Also both width and straightness are different. *[As for the slanted places, above and below, they have their differences. The standard for the straight places is the same.]* If one desires uniformity, it is necessary then to use a pattern to even things up. Take a piece of paper and divide it into thirteen crosswise rectangles. The first and the third should be 5/10's of an inch tall. The second should be 4/10's of an inch tall. All the remaining ten should be each one, 65/100's of an inch tall.

Now in every case mark a straight line down the widthwise center (of the paper strips). This will be the base line. According to the various places on the ch'in's face: *[altogether thirteen places*.]

1. the forehead, *[the first strip.]*

2. the bridge, *[the second strip.]*

3. the neck, *[the third strip.]*

4. the shoulders, *[the fourth strip.]*

5. the hsiung (胸) (chest), *[the fifth strip. This is between the third and sixth hui or at the fourth hui, sixth fen.]*

6. the sixth hui, *[the sixth strip.]*

7. seventh hui, *[the seventh strip.]*

8. the border for the beginning of the waist, *[the eight strip at the border for the eighth hui.]*

9. the middle of the waist, *[the ninth strip is at the ninth hui, fourth fen.]*

10. the end of the waist, *[the tenth strip is at the tenth hui.]*

11. the thirteenth hui, *[the eleventh strip.]*

12. thirteenth hui, fifth fen, *[the twelfth strip.]*

13. at the inner border of the nut mouth, *[the thirteenth strip is at the tail border.]*

and according to each place's crosswise width, and marking from the center base line, measure out to the two sides left and right, and mark this all down on the successive crosswise strips.

These then are the measuring lines for the widths of different areas on the ch'in. Now according to the crosswise widths of the above mentioned twelve areas, within the borders of the first and seventh string lines which run from the inner border of the bridge down to the inner border of the nut mouth, measure and mark these (widths) on the successive crosswise paper strips. Do it by measuring out from the base line to the said borders. These lines are the straight measuring lines for the width of the one to seven string borders. Now in between the lines marking the outer boundaries and the lines marking the one to seven string boundaries, mark on all the strips seven straight lines. *[On every section in the middle and on the left and right there now should be nineteen straight lines.]* (The strips for) the two areas of the bridge and the neck are only divided up by three straight lines. After this then on the tail section crosswise paper strip, *[that* *is, the section marked by the inner border of the nut mouth.]* starting from the base line, gradually make a curved shape out to the one to seven string border lines. Although curved, it should seem flat. Now starting from here gradually make it more curved down to the outer limits. This should resemble a crescent moon bow shape. Whether it bulges up or evenly slopes off is determined by one's own deliberations and does not matter. Further the overturned form is fixed by this one action. All this more or less causes the ch'in above and below[12] to be uniform and even in its straightness or obliquity. So the path of the string is naturally suitable and there is absolutely no resistance in fingering.

But in front and in back the width is not the same, so how can one make the curved, overturned form uniform? This method involves another strip of paper. Its length is of no consequence, as long as it is over an inch in length. It should be as tall as the previous strips of paper; that is, the ones that were 65/100's inches tall. Now make crosswise lines and take the paper slip and oppose it *[what is being opposed are the lines on both sheets of paper, which should match up and not be helter skelter.]* to the height of the previously drawn paper slip for the tail section. *[They should both be 65/100's of an inch tall.]* According to the curved places on the tail strip's half sides, *[left and right each are half sides.]* with their straight lines which make up eight sections, *[left and right both have eight straight sections.]* mark out successive crosswise sections on the second slip.

Once having finished marking these out, then take the eight sections marked down on the strip and oppose these to the straight lines on the various left and right (halves) *[left and right there are eight straight lines.]* of the previous sections. *[This refers to the thirteen sections.]* Make sure that this strip is placed correctly opposing the other strips' straight lines. Then one by one make dots to mark it (the curve's position). Now according to the dots, ink in the curves. Thus the overturned shape for all the sections is made complete.

However the heights of the crosswise strips for the forehead, bridge and middle of the neck are not 65/100's of an inch, but are 45/100's and 5/10's of an inch. So then on the paper strips for these there can be only two crosswise lines above and below. *[The length must match the other's (e.g., the bridge) height, so that one can obtain the curved form.]*[13] These strips do not have eight lines, they only have four. Then on the paper strip there should also only be four lines in order to match. *[Use the lines closest to the one to seven string border lines. Do not use the lines near the edge.]* In so much as the one to seven string border lines in this area get especially broad, and as they progressively get nearer the edge, so then the overturned form from the center to the one to seven string border lines is only slightly curved, while actually seeming level. Here because from the one-seven string border lines to the extreme edge there is only 5-6/10's inch or so, therefore one need only divide with four straight lines. So only these four top lines are used for the curved form. *[On the (transfer) paper strip there are eight straight lines. The four above are closer together, while the four below are further apart.]* As for the forehead, on both sides it slants less than 1/10th of an inch and no more. This area

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[12] The text is still referring to the top. The head is below and the tail is above.

[13] I think he is talking here about the additional strip used to transfer the curve. The two crosswise lines above and below on the additional transfer strip make four and their length is controlled by the height allotted to the line under the curve.

also, basically has nothing to do with the sound capabilities or the fingering. Consider its form and put it on a strip (however one pleases).

Now all the successive sectional forms have been drawn. After this use thirteen hard wood strips, with each one's thickness measuring 5/10th's of an inch, and with length like each section's breadth. *[Each wooden strip's length should be equal to the crosswise breadth of each successive section of the ch'in's face.]* Also their width should be equal to the (paper) strip's height. *[Each wooden strip's width is equal to the previous paper strip's height.]* Now take the previous strips with their crosswise sections indicating the curved form and stick them squarely on the side face of the (appropriate) wooden strips. Now on the top of the wooden strips, according to the straight lines, *[On each in the middle, and on left and right, altogether there are nineteen straight lines. Excepting the two border lines, there are seventeen lines.]* on the paper strips which are stuck to the side, position a drill and make small holes through the wood. Afterwards cut out the thirteen wooden strips according to the paper forms, which are stuck on the sides with their curved tops and level bottoms. Thus are made the mother forms for the overturned shape.

Now take these wooden forms and put their flat edges down on the ch'in face according to their respective positions. One should use an iron drill that is 65/100's of an inch long. *[The size of the drill must be equal to the length of the holes. So the standard is 65/100's of an inch long. If it is too long, then the ch'in's face will be thin. If it is too short, then the ch'in will be too thick.]* And then drill down through the middle of the wooden strips (in the holes) with the drill's base *[from the drill's point to the base should be 65/100's of an inch.]* and stop when it gets to the surface of the wooden slips. Then the sharp point of the drill will enter into the ch'in's face. When one has drilled down into all the sections, then use a long plane and starting from the tail, plane the straight and slanting parts down to the forehead. Now on all the sections one must take as a goal using the plane to get rid of the sections scarred by the drill. On both the left and right use the plane down to the sides. Then the whole body's overturned form is finished and perfected.

The following drawings[14] are of the paper slips with their crosswise sections which are used as models in making the overturned form. Only the nut section, the shoulders, and the bridge, plus the pattern taken from the tail section (and the transfer slip) are drawn here. The rest are like these.

The forms[15], sections and measurements of Cheng-ho (正合) (lit. Upright Harmony), Chiao-yeh (蕉葉) (lit. Plantain Leaf), and Tz'u-chun (此君) (lit. This Gentleman) (ch'in styles) have also been recorded for purposes of selection.

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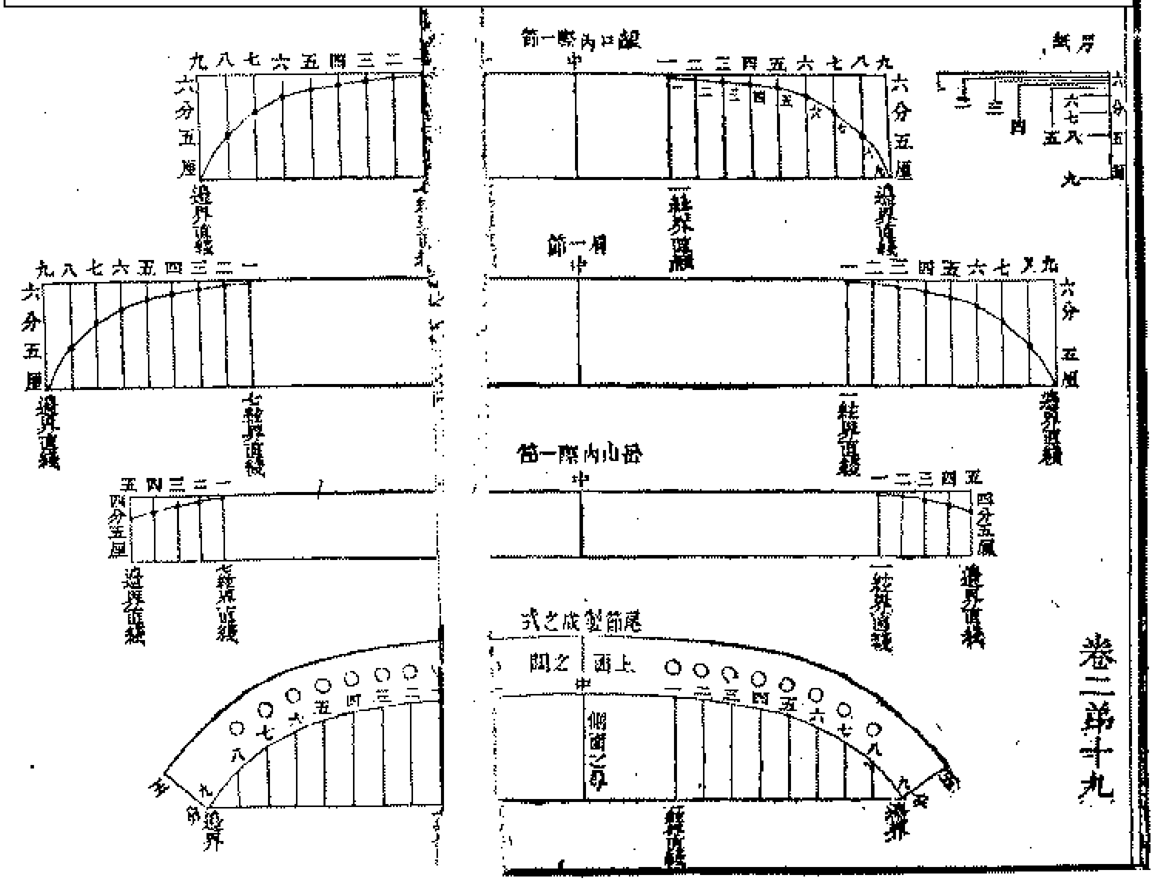
[14] Figure 2.
[15] Figure 3.

Figure 2, mother forms and transfer slip.



Note: At the top right is a guide to the transfer slip. The top three (left-hand) drawings illustrate selected forms; nut, shoulders, and bridge respectively. The bottom form gives an overview.

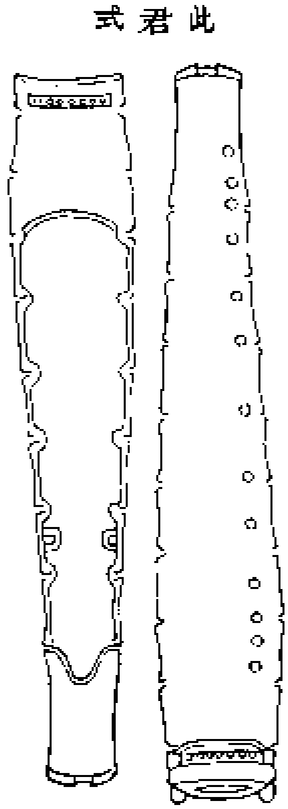


Figure 3, left to right, Cheng-ho, Chiao-yeh, and Tz-u chun ch'in forms.