

Orchestrating the World

- a manual of intercultural music making

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- Zheng



Description

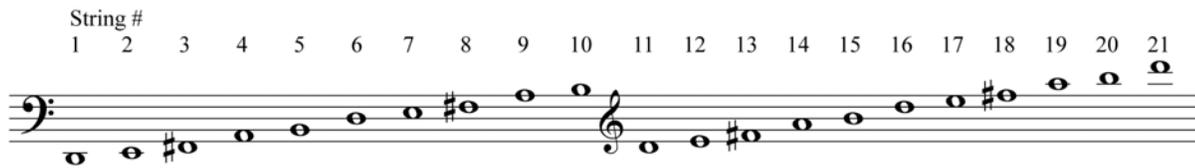
(pronunciation: *djung*) A plucked half-tube wood zither from China, with movable bridges over which strings are stretched. The strings were traditionally made of silk, but today they are usually made of steel or metal wound nylon. The modern Zheng usually has 21 strings, tuned to a pentatonic scale. The performer uses the right hand to pluck the strings, and the tone can be modulated by the left hand pressing the string on the non-speaking side of the bridge. Excellent arpeggios, chords, glissandi, bends, and delicate ornaments are obtainable from the instrument.

Tuning

The 21 string zheng is tuned variably, depending upon the scale desired. The best way to understand the tuning is to begin with the basic tuning, which is the pentatonic scale of Chinese Music. Taking string # 1 as the lowest and #21 as the highest, we obtain the following tuning:

| <u>String #</u> | <u>Note</u> | <u>Piano Notation</u> | <u>Frequencies of A's</u> |
|-----------------|-------------|-----------------------|---------------------------|
| 1 | D | D18 | |
| 2 | E | E20 | |
| 3 | F# | F#22 | |
| 4 | A | A25 | 110hz |
| 5 | B | B27 | |
| 6 | d | D30 | |
| 7 | e | E32 | |
| 8 | f# | F#34 | |
| 9 | a | A37 | 220hz |
| 10 | b | B39 | |
| 11 | d' | D42 | |
| 12 | e' | E44 | |
| 13 | f#' | F#46 | |
| 14 | a' | A49 | 440hz |
| 15 | b' | B51 | |
| 16 | d'' | D54 | |
| 17 | e'' | E56 | |
| 18 | f#'' | F#58 | |
| 19 | a'' | A61 | 880hz |
| 20 | b'' | B63 | |
| 21 | d''' | D66 | |

Zheng Tuning



The zheng can be tuned differently from the basic tuning, by moving the bridges around. It is important to remember that the 'distance' of the octave needs to remain the same, i.e. - the scale is comprised of 5 strings, the sixth string being the octave. The rule of thumb is that each string can be tuned over a range of 1 tone, 1/2 tone up or 1/2 tone down. For greater interval deviations, please consult with the performer.

At the beginning of the piece, the tuning should be given exactly. There are many possibilities in this regard, and tunings that vary the notes in the different octaves are also possible. A tonic should be chosen, especially when notating in Chinese notation, since the numbering will indicate the pitches to be played.

Retuning during the course of a work requires a little time. To change the tuning of any one string, its bridge has to be moved, and this takes several seconds. It is common to retune between movements of a work. The composer should bear these issues clearly in mind when writing for the zheng.

A note on intonation

In China, intonation is mostly 'just', not equi-tempered, thus, when playing with western instruments this structural difference may create difficulty. With careful listening however, the difficulty can be overcome.

Notation and String Numbering

The usual considerations for Chinese instruments apply - one can choose either Chinese or Western notation or a combination of these. If western notation is utilized, many, if not all, Chinese musicians will annotate the music in Chinese notation, since this is their first choice. It may work well for the composer to notate in the western 5 line staff and add the Chinese numbers to it for them. This may be laborious, and it is not generally necessary for Chinese musicians, who are quite adept at both systems.

In western notation one generally writes for the zheng at pitch, utilizing the bass and treble clefs. In Chinese notation one utilizes the French Chev  number system. Sometimes the performer will request a 'movable do' system. In such a situation, the piece may be written in a C tonic, and the zheng becomes a transposing instrument. Consult with the performer as to their preference.

In western notation, when notating certain ornaments such as bends, it is sometimes necessary to indicate the string upon which the ornament is executed. In traditional zheng repertoire the only string numbers that are used are 1, 2, 3, 5, and 6. These correspond to the notes of the pentatonic scale. There are 5 tonics which are traditionally used: D, F, G, Bb, and C. In these scales the note names and string numbers will be as follows:

Tonic D: D = 1, E = 2, F# = 3, A = 5, and B = 6.
Tonic F: F = 1, G = 2, A = 3, C = 5, and D = 6.
Tonic G: G = 1, A = 2, B = 3, D = 5, and E = 6.
Tonic Bb: Bb = 1, C = 2, D = 3, F = 5, and G = 6.
Tonic C: C = 1, D = 2, E = 3, G = 5, and A = 6.

In a tuning which departs from the pentatonic, the scale degree of any given note may not be reflected in the string number, but rather the traditional string number only will be utilized. Thus in a tuning such as: D E F A C, the strings may be numbered as follows:

D = 1, E = 2, F = 3, A = 5, and C = 6.

Here the C is numbered **6** even though its scale degree may indeed be **7**. **These considerations are not written in stone.** One performer may prefer one numbering over another, and depending upon the work, and in consideration of tonic modulations, the string numbering for a given piece may be specific to that piece. Some would insist that the numbering for the tuning above must be:

D = 1, E = 2, F = 3, A = 5, and C = 7.

The only rule of thumb is to adhere to the traditional pentatonic string numbering in the tonic of D.

Tonic D: D = 1, E = 2, F# = 3, A = 5, and B = 6.

When writing in Chinese notation, the note numbers are the chief indicators of the pitches to be played, these being paramount it may confuse the performer to see a circled '6' where a 7 is actually being sounded. Clarify these issues with the performer.

Unusual Notations for Unusual Tunings

For tunings that are different in different octaves, a tablature which works according to string number (without reference to pitch) may be useful. However, in order not to confuse the player, who is accustomed to Arabic numerals representing pitch classes, a different alpha numeric system would have to be utilized.

Another manner of dealing with this situation is to specify the tuning of the entire instrument, numbering the pitches with precise pitch classes. In western notation, the actual pitch will be apparent from its placement on the staff, and in Chinese notation, the 'dots' system will indicate the octave in which the pitch is found, for example, for the tonic note D:

| | | | | |
|----|----|----------------|----------------|----------------|
| D | d | d ¹ | d ² | d ³ |
| 1̣ | 1̣ | 1 | 1̣ | 1̣ |

Range

Zheng range - D to d³



The range for the 21 string zheng extends from D (below the bass clef) to d³. Some extensions can be made, by tuning the low D down a half-tone, or by tuning the high d³ up a half-tone. Check with the performer about these extremes of tuning.

Historically, the zheng had fewer strings, but today's professional instrument comprises 21. There are smaller zhengs, with 16 notes, for playing traditional folk repertoire.

General Considerations

In traditional Chinese music, the Zheng plays a significant role in ensembles. However, it is known as a great solo instrument. It has excellent projection, but still retains a sweet sound, and is capable of very subtle nuances and a large range of feeling.

Very idiomatic to the zheng are arpeggiations, repeated patterns, chordal textures, and tremolos. Microtonal nuances and ornamentations are highly performable, for instance melodies with bending and shakes. Quick scalar runs are not as idiomatic, though with proper preparation and due consideration for the necessity of bending notes, the entire gamut of notes can be rendered by any professional. Other nuances include muted notes and harmonics.

Method of Play

Strings are played on the speaking side only - the other side of the bridge does not render a defined note, however it is used as an effect sometimes. All the in-between notes, those that lie between the pitches of the tuned strings, are produced by pressing the strings behind the bridges with one hand while plucking with the other. However, these pitches are much harder to define than those on the open strings and to a large degree, using these bent notes as stable notes or for harmonic purposes is not desirable.

Each string can be pressed, or bent, to a maximum interval of 1½ tones. The higher the string, the greater its tension and so greater care must be taken with these, and there are some limitations as to how great an interval one may achieve in instances of higher string tension.

Plectra are worn on the fingers of the right hand only. This hand plucks the strings, while the left hand is utilized to create bends on the non-speaking side of the bridges. The left hand is also utilized to pluck the strings. The fingering patterns are important to bear in mind: *middle-thumb-index-thumb* is most common. The ring finger is also used, but the aforementioned are the basic. It is not necessary to notate the fingering.

Hand Span

The normal hand span covers an octave for certain, but up to 2 octaves is quite possible. In traditional zheng compositions, no more than an interval of an octave is called for.

Dynamics

The zheng's dynamic range is not large, but aggressive playing is possible, and will project more. Playing more notes at once will add presence, and long glissandi, which utilize many strings, are quite idiomatic and will certainly project well.

The zheng is a very resonant instrument with a long decay; however, the higher the note played, the shorter the speaking length of string, and thus the quicker the decay.

Speed of Execution

Speed of execution depends upon the musical figure being played. Tremolos on one note can be done very quickly, whereas melodic figures which require bending the strings, and/or intervallic leaps, will be harder to execute at extreme speeds.

Techniques

I. String Bending Techniques

By means of bending a string on the non-speaking side of the bridge, a variety of techniques are performable. Here are the techniques obtainable by string bending.

- **Vibrati** of large and small frequency ranges and at all speeds. Many subtle variations are possible: slow, vibrato with portamento (gliss), on one stroke quickly, on multiple strokes, fast and forte, etc.
- **Ornaments** executed with string bending include upper and lower mordents and grace notes. The composer must consider all necessary preparation of the notes called for; for example, in a lower mordent, the upper note must be 'pre-bent' in order for the ornament to be performed.
- **Microtones** can be called for as well.
- **Intervallic bends**, in other words, bends of two or more notes together, are possible. They are less difficult the smaller the interval. Much strength is needed for octave bends, for instance. Check feasibility with the performer.

String Bending - considerations

The composer must always bear in mind that string bending occupies the left hand, and it is variously difficult to do many string bends in succession on different strings. This is all the more so if the strings to be bent in succession are intervallically - therefore physically - far apart, and/or if the performer is called upon to proceed directly from one string in an *unreleased bent position* to another string bend. Intonation too will become harder to control.

After releasing a bend the left hand can return to playing after a second. It is quicker if the left hand is to play a string close to where the bend occurred rather than further away.

Quick plucks on bends to obtain discrete notes can be performed by a fine professional. Excellent intonation on bent notes is always difficult to achieve.

The composer must remain aware that when a bent string is released, the sound of the unbent string will be made audible - the more so for a lower, longer decay note and in quieter passages. Decay is quicker with the higher pitched strings. The bent note's decay rate also depends on how vigorously the string has been plucked. In thin textures the release of this note will be heard clearly, unless it is allowed to decay completely. This could take some time. In denser textures, the note can be released after a beat or two and not interfere much with the sounds that succeed it. However, there will still be a 'shadow' sound of the released string.

II. *Glissando*

Glissandi are quite idiomatic, just as on the western orchestral harp. The first and last notes of the glissando are notated with an appropriate glissando marking connecting them.

III. *Tremolo, Tremolando*

Tremolos on one note at a time are easily done, as well as tremolandi over a small diapason, where a string is bent while playing tremolo. Tremolos can be measured or unmeasured.

Intervallic tremolos are executable, but adjacent string tremolos are harder to execute than those which use strings further apart.

IV. *Arpeggios and Chords*

- Chords can be played as plucked figures, or in arpeggio.
- Using both hands, up to 8 strings can be fingered on a chord.
- Arpeggiated chords ranging more than an octave are performable, though speed of execution will be compromised the larger the range.
- Utilizing a bent string in a 4 note/one hand chord may not intone well. This must be considered an extended and virtuosic technique, done in consultation with the performer.

V. *Harmonics*

Harmonics, up to the 5th partial (on a lower string) are possible. Consult with the performer for feasibility. One hand harmonics are also executable, thus freeing the other hand to play other strings at the same time.

VI. *Muted Notes*

There are different kinds of muting possible.

- a) Muting with the left hand finger on the bridges (1/2 mute);
- b) Muting with left hand on the strings while playing with right (full mute);
- c) Muting with right hand while playing, using the palm's outer edge;
- d) Muting with either hand, after playing, to stop the sound;
- e) In a glissando, muting certain strings with the left hand's fingers in order to accentuate a specific combination of pitches.

VII. *Accents and Timbres*

Accents

Standard accents can be called for.

Timbres

Playing closer to the pressure bar (the right side of the player) gives a more projected sound, but the sound becomes quite brittle very close to the bar, especially on higher strings. Closer to the bridges the sound is softer and less defined, especially in the tenor and bass areas.

Timbre is also effected somewhat by which hand is plucking, since it is usual that the right hand fingers utilize hard plectra, while those of the left hand do not. Thus the left hand pluck may be softer in timbre.

VIII. *Other techniques*

- A kind of a 'bartok slap' is audible with aggressive plucking.
- A two thumb technique, with plectra on both, can be utilized to create very fast staccato like figures. The plucking is executed in quick alternation, and the flesh of the palms mutes the notes immediately. The resulting patterns, of notes and chordings, are highly dynamic and staccato-like. (Note: This is an invention of Randy Raine-Reusch)
- Harmonics can give an interesting effect when played with somewhat aleatorically.
- Moving the bridges while playing is possible. A gradual melody will work, never anything fast. A half step, either up or down, can be executed as part of a simple melodic movement.
- Percussive effects are possible: knuckles on wood; yarn mallets; other objects as beaters.
- Bowing the strings is also possible; check with the performer for feasibility, e.g - are the string planes convex enough to allow all strings to be bowed, or only the extreme high and low?

Asian Relatives of the Zheng

Kayagum (Korea)

Koto (Japan)

Dan Tranh (Vietnam)

Yatga (Mongolia)