

Music of the Whole World
- presentation # 2: December 7, 2005

The Musical Bridges between China and the West

- study materials
[revised February 2006]

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with bibliography and discography
compiled by Mark Armanini

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Chinese and Western music - Comparative Aesthetics

Chinese traditional art music is:

- written, and largely utilizes a number notation;
- homophonic (generally a melody line with some harmonic accompaniment);
- rhythmically simple in duple meter mostly;
- expressive, rubato, ornamented, and nuanced;
- mostly in just intonation.

Western art music is:

- written, and largely utilizes western staff notation;
- polyphonic (independent lines of music played together);
- rhythmically sophisticated by comparison with Chinese, triple meters abound, and compound meters also used;
- expressive and rubato, but not generally as nuanced and ornamented as Chinese;
- in equal temperament.

Some simple considerations

Chinese music values nuance and ornament, and utilizes heterophony (interwoven and related melodic lines) more than harmonic structures. In Chinese traditional art music the pentatonic scale and its transpositions are employed in most compositions, though more modern works certainly go further afield. To the traditional pentatonic mode, C D E G A, the F and B are added. Accidentals are not the norm. In the 20th century, Chinese music acquired a taste for western style harmony, and many Chinese composers are adept at writing for western forces, as well as for Chinese traditional instruments.

The bridge between Chinese and Western music is helped a great deal by the common practice of written music transmission. Outside of the court tradition, Chinese music was, until the mid 20th century, mostly presented by small ensembles, but over the last half century large scale western style orchestras have come into being, utilizing the entire spectrum of Chinese instruments. This tendency, towards larger orchestral forces, would seem to create another area of commonality with western musical practice, and much experimentation is being done, on both sides of the cultural divide, to fuse the two orchestral traditions.

Chinese Notation

General Considerations

Chinese music is written according to a number system, known as *jianpu*, which means "simplified notation" in Chinese. The system's invention is attributed to Jean-Jacques Rousseau (1742) but its development continued in the hands of Pierre Galin (1786-1821), Aimé Paris (1798-1866), and Émile Chev  (1804-1864). In some circles Chinese number notation is simply referred to as the French Chev  system. Variants of the number system are utilized all over Asia.

Nowadays, Chinese musicians can read western notation as well as Chinese. Many of them, when working from a Western staff notated part, will annotate it with the number system, since this is more native to their training.

The number system is similar in many respects with Indian notation, the main difference is that in Indian notation letters, representing the notes of the gamut, are utilized, whereas in Chinese notation numbers are employed. Like Indian notation, Chinese notation can be very useful as a musical shorthand.

In writing for Chinese instruments there are 3 ways to go: 1. we may use Western notation together with certain markings to indicate the specific techniques; 2. we may use Chinese notation throughout; 3. we may use both Western and Chinese notation in combination.

Note Numbers

To begin with, Chinese notation is conceived as a 'movable *do*' system. For the sake of elaboration we will take the tonic of the system as equivalent to the note 'C'.

The gamut is represented by the following numbers:

1	1#	2	2#	3	4	4#	5	5#	6	6#	7
C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

Considerations

- The tonic of any major scale will always be **1**, and the tonic of any minor scale will always be **6**.
- The key and tempo are noted at the beginning of the work, e.g.

1 = C 4/4 (C Major)

1 = **Ab** 3/4 (Ab Major)

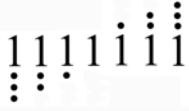
Note that even in cases where the key is minor, or for a mode, only the **1** of the key is indicated.

- Specific modes can be indicated supplementarily, for example **3** = **E** would mean the phrygian mode on E, thus the key signature is that of C major (no accidentals), but the tonic is E.
- Both flat (b) and sharp (#) signs are utilized in Chinese notation.

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- Lower octave notes are indicated by placing a dot below the number; higher octave notes are indicated by placing a dot above the number; 2nd lower octave utilizes double dots below; and 2nd higher octave by double dots above. And so on.

A six octave range would be represented thus:



Durational Elements

Pitch (melodic and harmonic) Notation

Here is the key to durational values, first in Chinese number notation, and below in Western staff notation.

1. A number on its own is a quarter note:

4/4 | 1 2 3 4 | 5 6 7 $\dot{1}$ ||



2. A number with one line below is an eighth note:

4/4 | 1 2 3 4 5 6 | 5 4 3 2 1 1 ||



3. A number with two lines below is a sixteenth note:

4/4 | 1 2 3 4 5 5 3 2 1 2 1 ||



4. Similarly, numbers with 3 lines below are thirty-second notes, with 4 lines below, sixty-fourth notes.

5. A number followed by a dash is a half note:

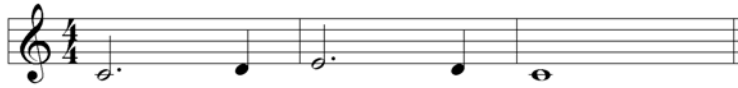
4/4 | 1 - 2 3 | 2 - 1 - ||



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6. A number followed by two dashes is a three quarter note, and a number followed by three dashes is a whole note:

4/4 | 1 - - 2 | 3 - - 2 | 1 - - - ||



7. A number followed by a dot (.) is a dotted note:

4/4 | 1 . 2 3 4 5 | 4 . 3 2 1 - ||



8. The number '0' represents a rest. Its duration is determined in the same way as that of note numbers.

4/4 | 1 2 0 3 4 5 | 0 4 3 2 1 - ||



9. As in western notation, ties are used to extend the duration of a note, e.g.

4/4 | 1 2 3 4 4 5 4 3 2 1 1 ||



10. Triplets and other added durational indicators are notated as in western music, with a slur over the notes affected and a number indicating values:

3/4 | 1 2 3 4 4 5 | 4 3 2 1 0 ||



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11. Harmonies, chords, double stops, and so on, are notated in a vertical fashion, thus:

$$\frac{4}{4} \left| \begin{array}{ccc} 5 & 7 & 6 - \\ 3 & 5 & 4 - \\ 1 & \underline{23} & 4 \underline{32} \end{array} \right| \begin{array}{c} 5 - - - \\ 3 - - - \\ 1 - - - \end{array} \parallel$$

Rythmic Notation

Non-pitched rhythms can be notated with **X**'s, and the rules of duration are the same as for pitch representations. Here is example 8 above, in rhythmic notation:

$$4/4 \mid \underline{\mathbf{xx}} \ \underline{\mathbf{0x}} \ \mathbf{x} \ \mathbf{x} \mid \underline{\mathbf{0}} \ \mathbf{x} \ \underline{\underline{\mathbf{xx}}} \ \mathbf{x} - \parallel$$

To further study Chinese notation, and number notation in general, peruse Chinese instrumental scores. Also, for study leads, see the bibliography below.

Orchestration of Chinese instruments

The following is an orchestrational guide for several Chinese instruments, namely: Erhu, Pipa, Dizi, and Zheng. This entire guide may be accessed and downloaded from the VICO website. Please go to www.vico.org, and click on 'VICO Instruments'.

- Erhu



Description

The Erhu is a bowed two-stringed instrument. It has a long round neck of hardwood attached to a hardwood resonator, usually covered with snakeskin. Its steel strings are tensioned between the tuning pegs at the neck's upper end, and the lower edge of the resonating box. The speaking length of the string extends from a nut at the peg end of the neck to a bridge placed upon the resonator. The horsehair bow, rosined on both sides, is inserted between the strings, and the strings are played one at a time, virtually never together. The player fingers the strings not by pressing them against the neck but by placing them on the strings lightly, to create different speaking lengths.

Tuning $d^1 - a^1$

Scordaturas and Extensions

In the Erhu $d_b^1 - a_b^1$ and c^1-g^1 scordaturas are possible, but an oversize instrument may render lower pitches better. Erhus with extensions are being made, but they are not yet common (as of 2004). With extension the Erhu can go down to a tuning of $a - d^1$.

Range

Full range: d^1 to a^3 ; practical range is d^1 to d^3 ; best sounding range is d^1 to a^2 ; From $d\#^3$ and above the instrument is very difficult to intone and has a weak dynamic. Useful only by virtuosos and in very transparent passages.

General Considerations

Dynamics

The dynamic of the Erhu is generally:

- d^1 to d^2 - nasal, rich, excellent projection
- d^2 to a^2 - a bit more flutey, still very good projection
- a^2 to d^3 - thinner and more delicate, still present, a bit difficult to intone
- d^3 to a^3 - very difficult to intone, very delicate dynamically, easily covered.

Speed of Execution

The speed of execution depends somewhat on the register being called for. As noted in 'Dynamics' above, the higher one plays, the more difficult the intonation becomes. Therefore, as a general rule of thumb, one should not write very quick passages above a^2 ; in the hands of an excellent player quickness will not compromise intonation up to d^3 .

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It is very idiomatic to play passages that call for very quick detache notes. However, leaps and intervals of more than a third cannot be executed very quickly. Certain musical phrases, which utilize string crossings can include leaps, but the crossings themselves may create some difficulty. Crossing strings on the Erhu is not as easily achieved as on the western violin - one cannot move back and forth between strings as quickly or as gracefully.

A suggested maximum speed - for passages that move stepwise (in 2nds) - is 504 per minute (i.e. - playing 16th notes where the 1/4 note is at 126 per minute), but this drops dramatically above a². Tremolos on one note can of course be executed with greater speed. As always, the performer ought to be consulted regarding the feasibility of very fast passages.

Techniques

I. Bowing and Fingering

- It is not easy to execute many notes on one bow; a few notes in a moderato tempo is safe to call for, but slurring over many notes, even at a soft dynamic, is best left to the discretion of the performer.
- The composer should be aware of quick string crossings (between the d' and a' strings); these entail a change in bowing and fingering; in most cases it will not cause a problem for the performer.
- Most bowed string techniques are possible: detache, legato, and staccato.
- Battuto (striking the instrument with the wood of the bow) is possible, but only for rhythm; it is impossible to extract the bow to create battuto of the strings.
- Downstroke is a movement 'out', the hand moves away from the body; upstroke is 'in', the hand moves towards the body.
- Double stops on the Erhu do not render clear intervals or pitches; as an extended technique please consult with the performer.
- There are certain idiomatic movements typical of Erhu technique, as follows:
 - *A slide down of a 3rd, e.g. - a¹ ↘ f#¹.
 - *Bending (tensing up and down) of a string, to create rise and fall of pitches (see 'vibrati').
 - *Many kinds of vibrati.
 - *An embellished style.
 - *All kinds of glissandi.

II. Vibrati

All vibrati can be played slowly or quickly. In general, 3 kinds are possible:

1. Pressing up and down against the string in one place - the pitch diapason remains small
2. Back and forth slide (no pressing)
3. Back and forth slide (no pressing), but quick and dramatic, using a larger pitch diapason

III. Harmonics

At nodes, a lighter press gives a harmonic; quite *pp*, a floating sound, easily covered.

<u>String</u>	<u>Natural Harmonics possible</u>
d'	2, 3, 4, 5, 6
a'	2, 3, 4

Artificial harmonics are possible but very difficult to execute.

Harmonics may not be greatly differentiated from regular notes played *pp*.

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IV. Pizzicati

1. Right hand plucks the string (d' string only, since the bow will rest against the a' string); the entire gamut can be played; renders a muted tone. Notes are marked with a + above them.
2. Left hand pizzicati are useful for open string work.
3. Can combine r.h. bowing with l.h. pizzicati on a single string, eg. - d' is bowed as a drone and rhythmic pizzicato figures are played on the open a' string; and vice versa, a' is bowed as a drone and rhythmic pizzicato figures are played on the open d' string.

V. Accents

Care should be taken that staccatos and accents not be over emphasized - sudden digging of the bow will compromise pitch. Two staccatos, light (⇄) and hard (.), plus one accent (>) are enough for most practical purposes.

VI. Special Techniques

- Multiple staccato on one bow
- Horse Neighing effect; this is the above mentioned multiple staccato together with a slide.
- 3 fingers successively play the same note on one bow stroke.

VII. Thoughts on Intonation

Discreteness of pitch needs to be insisted upon for transparent passages, unless a very soloistic effect is desired. Notes are often connected idiomatically with slides, though the main notes must be intoned clearly. In an ensemble setting, when the Erhu upper register melody is paired with a fixed pitch instrument, like Yangqin, intonation problems are reduced.

Notation

Notation: assume that the Erhu player can read western notation and the number system. For western notation writing in concert pitch is best though it is also possible to use a movable 'Do' system and write everything in C. For scordatura work this is preferable, for example: tune the instrument Db - Ab, then written C = Db concert; so playing something written with 1 sharp (F#) will render a Db Lydian scale.

Related Instruments

The Erhu is the most common of a family of two-stringed bowed instruments, known as Huqin (pron. hu'-chin). For the purposes of this manual, we will assume that the various instruments vary only in tuning and thus in absolute range. We will cite 3 Huqin: Gaohu, Erhu, and Zhonghu.

◆ Tunings of Huqin:

Zhonghu: g - d¹; Erhu: d¹ - a¹; Gaohu: g¹ - d²

Asian Relatives of the Erhu

Korea	- haegûm (2 strings)
Japan	- kokyû (3 strings)
Mongolia	- morin khuur (2 strings)
Persia	- kamanche (4 strings)
Thailand	- Saw-thai (3 strings)
Cambodia	- Tro-u (2 strings)

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- **Dizi** (Chinese transverse bamboo flute)



Description

The Dizi is a bamboo flute with a membrane covering one hole to create an increase in resonance and a typical 'buzzing' quality. It is really a renaissance flute with a membrane. There are 6 playing holes. The speaking length is determined by blocking the pipe at both ends. There is extra pipe material which is just esthetic - this extra length does not effect the speaking length.

Since the dizi is mainly a diatonic-major-scale instrument, with very few accidentals playable, they come in many different lengths to accomodate the different keys that a piece of music may call for.

Tunings and Pitches

The system utilized for naming pitches is a 'movable do'. However, this too is divided into 3 systems:

1. The lowest note (the 'pipe note') is called 'Do';
2. The lowest note (the 'pipe note') is called 'Re';
3. The lowest note (the 'pipe note') is called 'Sol'.

Taking the dizi's pitches, from the lowest note (the 'pipe note') to one octave above, and taking this pipe note as 'Sol' we obtain the following:

Sol La Si Do Re Mi Fa Sol.

Thus 'Do' (of the diatonic major scale) in system #3 is obtained with the 3 lowest holes of the dizi open. Dizis are named by this 'Do'. This is regardless of the naming of the pipe note. Thus if pipe note's pitch is G, then this dizi will be called a C dizi, which is the pitch obtained when the 3 lowest holes of the dizi are open.

In traditional Chinese music, the part will always have an indication at the top for the pipe note, e.g. - 'Pipe note is Sol'. This is especially useful in Chinese notation which utilizes a number system, and so 1=Do, 5=sol and so on. The key then is secondary, since all the dizis will respond to the same movable do system.

Range

Concert Pitch and Written Pitch

The range of all dizis is 2 octaves and a major 2nd. Thus if the pipe note is Sol = g^1 , the dizi will have a concert pitch range extending from g^1 (above middle C) to a^3 .

The written range will always be one octave below the concert pitch.

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Scales and Modulations

The range of the dizi is not large. Also, being mainly diatonic - it possesses 3 basic accidentals, see below - modulation is restricted. It is common to utilize several flutes during the course of 1 piece, to overcome somewhat the limitations on modulation. However, even with the 3 basic accidentals, certain modes and scales will be unplayable on the dizi, even septatonic ones. Perhaps dizis could be constructed to render specific modes, which utilize non-diatonic intervals. As far as the author is aware, dizis with such properties have not yet been constructed.

Nowadays the players have 12 dizis to accommodate all the keys; however, the older folk musicians had one dizi only, which was played in 5 different keys, with half holing for the #’s and *b*’s. This was common practice until the mid-20th century.

Accidentals

The basic diatonic major scale can be expanded a little. By techniques of embouchure and some cross fingerings certain semi tones are possible. This is true of all dizis, regardless of size.

Taking the pipe note as Sol, one may assume the natural scale, i.e. the one that begins with the pipe note, is a mixolydian. Here, the 7th is Fa. The raised 7th, **Fa[#]**, is easily obtained. Other accidentals, though possible, are more difficult, and more problematic.

The next obtainable accidental, in this scheme, is **Si_b**. It is a bit sharp in the lower octave, a bit more in tune in the upper octave.

One more accidental obtainable is **Mi_b**.

Finally, the lower octave **Do[#]** is obtainable, but the higher octave **Do[#]** does not speak at all.

Some flutes are prepared with more holes in them, in order to obtain more accidentals. However, this reduces the resonance of the instrument and is not acceptable in traditional music.

Half-holing is not a good technique for the dizi. Performers may choose to avoid it, since the pitches thus obtained are very hard to tune. And it is never exactly 1/2 the hole that needs to be covered. Only in a very slow passage can one safely call for a half-holed pitch. This may work especially for the 1/2 tone above the pipe note.

Thus we can count on 3 basic accidentals in the scale and two other *special* accidentals.

Taking the pipe note as Sol, we obtain:

Sol [**Sol[#]**] La **Si_b** Si Do [**Do[#]**] Re **Mi_b** Mi Fa **Fa[#]** Sol [**Sol[#]**] La **Si_b** Si Do Re **Mi_b** Mi Fa **Fa[#]** Sol [**Sol[#]**] La

One ought to check with the performer before utilizing any accidentals apart from the 3 basic ones of **Fa[#]**, **Si_b**, and **Mi_b**.

Notation

The Dizi player will choose the best instrument for the notated music. He will transpose for the flute he is playing, depending upon the naming of the pipe note.

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In China musicians generally learn to read western notation - notes are written one octave lower than concert pitch. They also learn to read the movable do number notation (French Cheve system). Some may even prefer the numbered notation, since, being a 'movable do', no transpositions are required.

In writing in 'movable do' one would indicate, for example, as follows:

Pipe note = Sol

Do (1) = C

or

Do (1) = E and so on.

The dizi player will then choose the flute he deems best for the piece.

General Considerations

The closer a hole is to the blowing hole, the greater effect it has on pitch. A professional should have all 12 dizis, corresponding to all 12 keys of the gamut. A dizi which is very low (perhaps the lowest) is F (Pipe note = Sol = c' (middle C).

The smaller, higher pitched dizis are very strident in their upper register, much like the western piccolo. They project very well. In contrast, the larger/lower pitched dizis can be covered easily in their lower range. Still, projection for all dizis is good.

The membrane, made of a reed which is sliced paper thin, needs to be adjusted very carefully, at just the right tension: too tight and it won't vibrate, too loose and it will break.

Dynamics

Generally, the same considerations that apply to the western flute apply to the dizi. The volume is a bit bigger than western flute, but when playing at very soft dynamics it is difficult to bring the pitch up, i.e. intonation becomes a problem at softer dynamics. This is especially so when playing the higher register. The lower register's intonation is more controllable at a soft dynamic.

Here are some general guidelines for dynamic projection:

<u>Range</u>	<u>Projection</u>
low	ppp → mp
mid	p → f
high	mp → fff

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Speed of Execution

In diatonic progressions the dizi is very quick, as agile as the western flute. If utilizing accidentals the pace slows somewhat, due to the imposition of cross fingerings. Of the 3 basic accidentals we may assume as follows (Pipe note = Sol):

Fa[#] can go very fast.

Si_b and **Mi_b** are not as fast.

Techniques

I. Tongueing

All kinds of tongueing are performable, single, double, triple and flutter. There are 2 kinds of flutters: 1. Guttural 'r' flutter (French 'r') - a flutter that can be quite soft; 2. Rolled 'r' flutter (dental-tongue) - a more forceful flutter.

II. Vibrati and Glissandi

Both pitch and amplitude vibrati, are possible, and at various speeds.

Glissandi are highly executable with the exception of movement across the pipe note. E.G. - where pipe note = **Sol**, a glissando from **La** down to **Fa[#]** will not be playable (since the pipe note **Sol** is played with all holes covered.)

One may differentiate between a glissando which is smooth and one which has a more 'stepwise' sound in it.

III. Harmonics

Harmonics on the lower 3 holes of the pipe are very effective. A safer limit would be the lower 2 holes. On these a 3rd harmonic (one octave and a fifth higher) is possible - these pitches will sound softer and more distant than the same pitches played by overblowing.

IV. Accents

All accents are performable: staccato, legato, tenuto and the combinations of these.

V. Special Techniques

There are a variety of special techniques possible. Here we mention a few.

Bird Sounds

The dizi can imitate bird sounds very effectively. Consult with the performer about the effects possible, and the notation of these.

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Striking at Holes' Edge

Striking at the edge of a hole while playing a note is an effective way of playing a repeated note without tonguing or renewing the breath. There will be a little 'bump' in the sound. (Note: In India the notes thus rendered on bamboo flutes are called 'janta svaras'.)

Rolling Hand

A special effect can be created by rolling the hand across the bottom 3 holes of the pipe.

Throat Singing

The player can sing with the throat while playing.

Related Instruments

Xiao - this is a vertical bamboo flute with the same range as the dizi but without a membrane. It is not as flexible as the dizi and is harder to intone. It is a delicate instrument with a softer dynamic.

The xiao is good for expressive solo playing, but does not project well as part of a larger Chinese ensemble or orchestra. One way to obtain the xiao's sound for such settings is to take a dizi and cover its membrane, rendering the membrane inoperable. The dizi will thus imitate the xiao's sound while retaining good projection, flexibility, and intonation. The projection is somewhat lessened without the resonance of the membrane, but is still much stronger than that of the xiao.

- **Pipa**

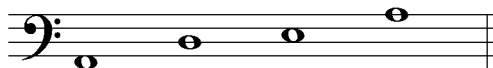


Description

A pear shaped lute with 4 strings and 19 to 30 frets, it was introduced into China in the 4th century AD. The Pipa has become a prominent Chinese instrument used for instrumental music as well as accompaniment to a variety of song genres. It has a ringing ('bass-banjo' like) sound which articulates melodies and rhythms wonderfully and is capable of a wide variety of techniques and ornaments.

Tuning

Pipa tuning - A d e a



String # 1 2 3 4

The pipa is tuned, from highest (string #1) to lowest (string #4):
a - e - d - A.

In piano notation these notes correspond to:
A37 - E 32 - D30 - A25 (where A37 is the A below middle C).

Scordatura

As with many stringed instruments, scordatura may be possible, but one needs to consult with the musician about it. Use of a capo is not part of the pipa tradition, though one may inquire as to its efficacy.

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Notation

One can utilize western notation or Chinese. 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 necessary for Chinese musicians, who are quite adept at both systems.

In western notation one writes for the Pipa at pitch, utilizing the bass and treble clefs. In Chinese notation one utilizes the French Chev  number system.

In traditional pipa notation there are many symbols that are utilized to call for specific techniques. These can be included, or simply described in other ways by the composer. See below in the discussion on technique.

Range

Pipa range - A to d'''



Assuming an instrument with 29 frets, the full range of the Pipa extends from A (an octave and a minor third below middle C) up to d³ (two octaves and a major second above middle C). Thus the full range of the Pipa is almost 3 1/2 octaves. In practice the extreme upper register is used little. On the following page is a fret diagram of the pipa with the note numbers next to the frets.

Strings 3 and 4 are not normally played above a major 10th, or fret number 16. Strings 1 and 2 are played up to 2 octaves and a fourth, or fret number 29. Check these limitations with the performer.

Positions of play on the Pipa

Positions are very important in writing for the Pipa.

- Open or nut position
- I - is the 1st position, from fret 7 to 12
- II - is the 2nd position, from fret 13 to 17
- III - is the 3rd position, from fret 18 to 24
- IV - is the 4th position, from fret 25 up.

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Pipa Fretboard

Open strings

4: A = 5 = Sol

3: d = 1 = Do

2: e = 2 = Re

1: a = 5 = Sol

# 4	# 3	# 2	# 1
5(A ₂₅)	1(D ₃₀)	2(E ₃₂)	5(A ₃₇)
6	2	3	6
		4	
7	3		7
1	4	5	1
2	5	6	2
3	6	7	3
4		1	4
	7		
5	1	2	5
6	2	3	6
		4	
7	3		7
1	4	5	1
2	5	6	2
3	6	7	3
4		1	4
	7		
5	1	2	5
6	2	3	6
		4	
7	3		7
1	4	5	1

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General Considerations

The Pipa is one of the solo instruments of the Chinese instrumentarium. It has a bass-banjo like sound, and it cuts through ensemble textures very well. Quick scalar runs, strummed chords, tremolos, muted notes, harmonics, and percussive noises are all idiomatic to the instrument.

The Pipa is played by all the fingers of the right hand. The performer wears plectra on 4 of these fingers (excluding the thumb). The left hand fingers the notes at the frets along the neck of the instrument.

Hint for Composing for the Pipa: Tune a guitar to the pipa tuning (5-1-2-5, i.e. sol-do-re-sol). Working with this configuration will approximate what the pipa can do.

Dynamics

The Pipa has excellent dynamic qualities, and can be assumed to play from *pp* to *ff*. Strumming, or playing several strings at once as a springboard to single notes, or as an ostinato for a melody on a higher string, increases dynamic intensity and presence.

Speed of Execution

The pipa is capable of very quick scalar runs. Speed is lessened somewhat when crossing strings or when making leaps, but generally there are few limiting factors. While slurring (hammering off and on) is quite common, it is idiomatic for quick passages to be articulated one stroke to a note.

Techniques

I. Selected Traditional Techniques

Lun ☆ - a five finger roll used to play melodies, it is basically a tremolo for long melodic note durations. It can be executed on 1 string or 2 strings at a time. The five star symbol is placed above the note to which it applies, and an extended dotted line (.....) indicates that all notes beneath it are to be treated the same way.

Ban Lun (✚) - a grace roll of 4 fingers, where the roll ends in a longer note.

3 note Lun - a grace roll of three notes, two preparatory and one landing note. Usually used in faster passages.

Zhai ✎ - A high pitched muted sound effect, created by placing the thumb nail of the left hand against the string and plucking. Sometimes one can do the rolls to sound the effect. It is executed almost exclusively on the 1st string (the other strings do not speak as well).

Slap Stroke (L) - Executed with the thumb. Generally, it will be the thumb on a lower string, especially the 4th string. It creates a fret slap, like a "Bartok" slap pizzicato.


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Hammering on and off - There are many combinations of hammering off and on.

1. Hammer on with left hand, after right hand pluck.
2. Hammer off with left hand, after right hand pluck.
3. Combinations of 3 & 4, pluck with right hand, and hammer on and off, or off and on.
4. Combinations covering a diapason of 3 notes, e. g. - a right hand pluck followed by two hammerings on.
5. Left hand pluck off - free left hand action, no right hand pluck.
6. Left hand hammer on - free left hand action, no right hand pluck.

Hammering up (on) is more common than down (off). Seldom is the little finger of the left hand used to hammer off since its lack of strength will result in poor projection. But the little finger can perhaps be used to finish a combination.

II. *Vibrato, Glissando, Tremolo, Trill etc.*

Vibrato - A strong vibrato, very emphasized, is obtained by quickly bending the string back and forth. Thus it is a pitch vibrato. In traditional chinese notation its symbol is: 


String Bends (or pulls) - There are many combinations of bends. They are normally notated by a curved arrow above the notes to which the bend applies: 


a) The bent note can be prepared before the pluck and then released to render a downward bend.


6 5

b) An upper mordent type is easily executed, notated thus:


5 6 5

c) A rise in pitch, somewhat indeterminate and ornamental is written e.g. 5 

d) An indeterminate downward bend, written e.g. 5 

Glissandi - There are several considerations to be kept in mind.

a) Ordinary gliss up or down - e.g. 5 gliss up to 1: one finger plays the 5 and slides up to the 1.


5 1

b) Most glisses are very fast and indeterminate. The gliss arrow is placed above the note number only (not between two note numbers). In actuality this is an ornament.


5

c) The lower the note, and the lower the string, the better the gliss will speak.

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Tremolo is highly idiomatic and effective. It can be performed on melodies one note at a time, and also can articulate a melody while playing arpeggios on other strings, as in western guitar technique. There are several methods of production.

1. Five finger roll (see 'Lun' above) - The tremolo can be produced by a five finger roll. The five finger roll is executed mostly on the 1st and 2nd strings; on the 4th string for example, this roll lacks power.
2. With the plectrum-nail of one of the fingers - This method, which utilizes the plectrum-nail almost as a plectrum on its own, renders a more even tremolo than the five finger roll technique.
3. Thumb and Index - This is a 2 finger tremolo executed on one note. This action, of thumb-index-thumb-index is commonly used to articulate melodies.
4. Two string tremolos - These can be produced in a variety of ways, very effectively with the five finger roll.

Trills are very performable on the Pipa, with or without a right hand pluck.

Tremolando is performable, a combination of gliss and tremolo, in Chinese notation it would be represented by the gliss sign plus the sign for a five finger roll with the dotted extender line.



III. Harmonics

Both natural and artificial harmonics are obtainable.

Natural Harmonics do not require any special notation; simply specify the resultant note with a ° above it. On the 4th string one can obtain partial numbers 2, 3, 4, 5, 6, 8, 12.

Artificial Harmonics are created by the ball of the right hand; once the tone is produced vibrati and even bends are possible. It is better and easier to indicate the position of the harmonic, i. e. where it is played, but it is not entirely necessary. What is essential is to indicate the resultant note with a ° above it plus the word "artificial".

IV. Muted Notes

Muted notes are performable on the Pipa. The palm edge of the right hand can be utilized to mute the string being plucked, though this author does not know how common this is in traditional Pipa playing. Please check with the performer.

V. Accents and Timbres

All the standard accents can be called for.

Timbral variation - the composer should always check with the performer as to the effectiveness of the following techniques.


- a) playing closer to the bridge or closer to the fretboard;
- b) utilizing the flesh of the thumb rather than the plectra;
- c) utilizing different plectra materials.

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VI. Harmony and Chords

Harmony and chords, though not as idiomatic as on western fretted strings, are definitely in use on the Pipa. The 1st and 2nd positions are best for playing combinations of notes. The open (nut) position is not as good due to the large distance between frets. Position 3 and higher positions are not good due to the small distance between frets. Barring is fine. Two note combinations are best - 3rds, 4ths, and 5ths are effective, and occasionally 6ths on adjacent strings. Plucking the 3rd and 1st strings together, or the 4th and 2nd strings together, give rise to more possibilities. Use of an open string together with a 2 note combination can fill out a chord effectively.

VII. Other Special Techniques

-  - Two strings are crossed and the plucking of them creates a percussive sound. This sound can be played to articulate a rhythm.
- Knocking sounds can be played on the body of the Pipa, and are quite a common technique.

Related Chinese Instruments

Liu qin - a smaller plucked string fretted lute, akin to the pipa, it is tuned: **g - d¹ - g¹ - d²**

Ruan - also known as the Chinese guitar, it too is fretted and plucked, but has a mellower tone than the pipa; its role is to the pipa as the viola's is to the violin in the west. It is tuned: **A - d - a - d¹**

Asian/Middle Eastern Relatives of the Pipa

There are many lutes in Asia, many of which are utilized in rendering the modal musics of the Near and Middle East. Here are two notables.

- Biwa (Japan)
- Oud (Middle East)

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• Zheng



Description

(pronunciation: *dzung*) 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.

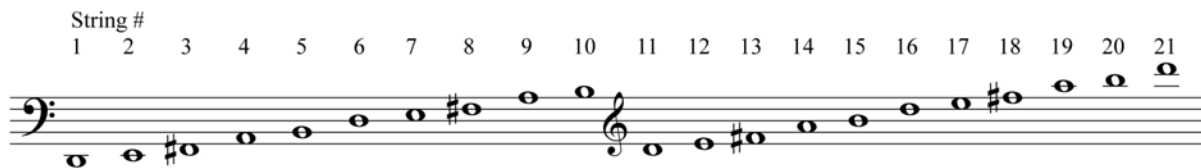
Tuning

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	

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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 e 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:

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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

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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.

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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.

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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.

Intervalllic 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.

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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)

Descriptions of selected Chinese Instruments

Dizi - (pronunciation: *deets*) A bamboo flute with a membrane covering one hole to create an increase in resonance and a typical 'buzzing' quality. It is really a renaissance flute with a membrane. There are 6 playing holes. It is mainly a diatonic instrument, and since its projection is excellent it is widely utilized as a solo instrument, both in the orchestra and in smaller ensembles.

Erhu - (pronunciation: *er' - hu*) A bowed instrument from China with a long neck and two strings between which a horsehair bow is placed. The strings are tuned to a fifth. The sound box may take different shapes - hexagon, octagon, round, or ellipse - and is covered on one side by snakeskin. The Erhu performs an essential role in Chinese classical music as well as in the folk music tradition. It is held vertically to play - the lefthand plays without a fingerboard, while the right hand holds the bow and plays one string at a time.

Gaunzi The guanzi, also known as *bili*, is a double reed instrument with a cylindrical wooden or bamboo body. It comes in various sizes, and typically has 7 finger holes and one or two for the thumb. It is quite ancient, and has been used in a variety of musical contexts over the centuries, often as a solo instrument used to evoke a mood of sadness.

Pipa - A pear shaped lute with 4 strings (tuned A D E A) and 19 to 26 frets, it was introduced into China in the 4th century AD. The Pipa has become a prominent Chinese instrument used for instrumental music as well as accompaniment to a variety of song genres. It has a ringing ('bass-banjo' like) sound which articulates melodies and rhythms wonderfully and is capable of a wide variety of techniques and ornaments.

Qin - (pronunciation: *chin*) A seven-stringed zither without bridges, it is widely recognized as the Chinese instrument with the highest pedigree, as it has over 3000 years of history. It can be called Qin, but is also referred to as Guqin, as "gu" implies 'ancient'. Acoustically it is of very soft dynamic, and is not played as an ensemble instrument and hardly in public. It is reserved as an instrument of personal discipline and enrichment.

Ruan - A round shaped lute with a short neck, sometimes called the Chinese guitar, the Ruan has 4 strings (tuned A D A D) and 24 frets. It has a history of 1600 years and is used by orchestras and chamber ensembles as well as for accompanying operatic performances. Together with the Pipa, it has a major role to play in the plucked string section of all Chinese ensembles.

Sanxian - (pronunciation: *san' - shee - an*) A long necked fretless lute with three strings. In Chinese, "san" means three and "xian" means strings. The resonating body is made of a round wooden box covered with snake skin, just like an erhu. The instrument is played with a plectrum and is widely used to accompany singing.

Sheng - (pronunciation: *shung*) The sheng is a mouth organ made of bamboo, consisting of a bundle typically of 17 pipes (but as many as 36 in some larger models) attached to a wind chamber. The pipes are fitted with free reeds, nowadays made of brass. The Sheng is an ancient Chinese instrument and since it is capable of sounding up to 6 notes at once, it is utilized both as a solo voice and for harmonic accompaniment.

Suona - Known to some as the Chinese oboe, the suona is a double reed instrument with a long body of wood fitted with a flaring brass bell. It has a very brilliant, even strident, tone, and projects very well in any musical situation. For this reason it is utilized as a solo instrument extensively. As well, it has long played a role in weddings, festive events, and other ceremonial occasions. It comes in various sizes to accommodate different pitch ranges.

Xiao - (pronunciation: *shee-ow*) This is a vertical bamboo flute with the same range as the dizi but without a membrane. It is not as flexible as the dizi and is harder to intone. It is a delicate instrument with a softer dynamic. The xiao is excellent for expressive solo playing, but does not project well as part of a larger Chinese ensemble or orchestra.

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Yang Qin - (pronunciation: *yang - chin'*) A hammered dulcimer of China, it is played with rubber tipped bamboo mallets. It is capable of both melodic and harmonic roles, and has a range of more than 4 octaves. It is tremendously flexible in its musical usefulness, and can cross cultural borders with ease.

Zheng - (pronunciation: *jung*) 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.

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Chinese/Western General Study Leads

BC Chinese Music Association
#303-8495 Ontario Street
Vancouver BC Canada V5X 3E8

UBC Music Library
UBC Asian Studies Library
Vancouver Public Library

Chinese Music Society of North America
Po Box 5275
Woodridge IL 60517-0275
USA

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For more information on intercultural events, music, and study

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